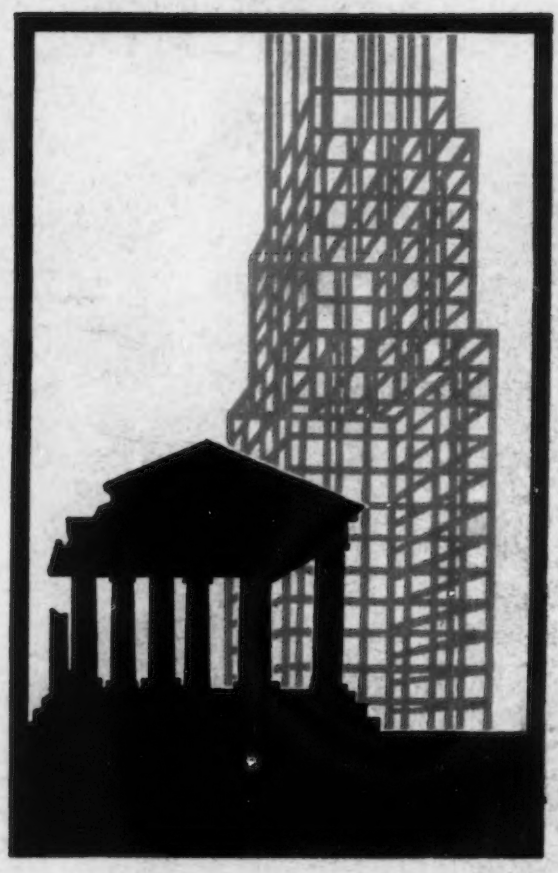
THE ARCHITECTURAL RECORD



JANUARY
1931

BERN
HARD

Seeley Winters Mudd Memorial Hall of Philosophy, University of Southern California. R.C. Flewelling, architect; R. Westcott Co., general contractor; Geo. White, brick work contractor; French & Melone, roofing tile contractors;

Cast stone by Watkins Co., Inc.

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ATLAS WHITE portland cement was used here for brick mortar and for mortar used in setting tile roof. Mortar obtained with Atlas White is pure white, non-staining and durable.

ATLAS WHITE portland cement was used here for making the cast stone of the walls and steps.

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THE ARCHITECTURAL RECORD

Published Monthly by F. W. Dodge Corporation, 115–119 W. 40th St., New York

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F.W. DODGE CORPORATION

Member Audit Bureau of Circulations and Associated Business Papers, Incorporated.

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ANNOUNCEMENTS

A press notice comes to The Architectural Record from Berlin stating that Hannes Meyer has been called to Soviet Russia as professor in Architecture and chief architect for Giprowtus in charge of design for all the technical schools in U. S. S. R. Herr Meyer was formerly director of the Bauhaus at Dessau.

The Society of Arts and Sciences has awarded its gold medal for architecture to Cass Gilbert "for his outstanding contribution to the skyline of New York in the design of the Woolworth Building." Presentation of the award will be made at a dinner given in honor of Mr. Gilbert at the Hotel Astor, Friday evening, January 16.

The Brooklyn chapter of the American Institute of Architects at the November monthly dinner appropriated $100 to aid unemployed draftsmen through the Architects' Emergency Committee. Many members recommended not only that public works be speeded up by the state and city, but that owners where possible should take advantage of prevailing low costs to improve their properties.

F. A. Harris, architect, announces that he has opened a new office in the Youngerman Building, Suite 301, Des Moines, Iowa, and requests that manufacturers' catalogs be sent to him.

R. N. Le Vee, architect, and W. H. Gmeiner, engineer, have opened architectural offices in Appleton, Wisconsin, and would appreciate receiving manufacturers' catalogs.

Samuel Zouri Moskowitz, architect, requests that manufacturers' literature be sent to him at 51 Riverside Drive, New York City, and also at 63 Hazle Street, Wilkes-Barre, Pa.

Black & Bigelow, Inc., engineers, announce the change of their firm name to A. A. Bigelow & Co., Inc. Mr. Archibald Black has resigned as president of the above firm, but will continue his association in the capacity of consulting engineer.

DODGE PLAN ROOMS

Architects are invited to make use of the plan room service maintained by the F. W. Dodge Corporation at the following addresses:

Birmingham, Ala.	415 Watts Building
Boston, Mass.	77 Sumner Street
Buffalo, N. Y.	315 Jackson Building
Chicago, Ill.	173 West Madison Street
Cincinnati, Ohio	622 Broadway
Dallas, Texas	1314 Wood Street
Detroit, Mich.	607 Shelby Street
New Orleans, La.	1210 New Orleans Bank Building
New York, N. Y.	119 West 40th Street
Philadelphia, Pa.	501 Bessemer Building
St. Louis, Mo.	1008 Chemical Building

It is suggested that in having plans blueprinted, one or more sets may be prepared for a Dodge plan room. This service gives the architect a wider range of subbids and material prices and saves congestion of materialmen and subcontractors calling to figure jobs.

CONTRIBUTORS TO THIS ISSUE

Jock D. Peters and Eleanor LeMaire: associated designers who have done much work in the West, notably the interior of Bullock's Wilshire department store in Los Angeles.

Prentice Duell: an archaeologist engaged at present in Egyptian explorations; he has made many mural paintings of excavated Roman works.

Gavin Hadden: an engineer specializing chiefly in stadium design.

Palmer Shannon: a New York photographer who has specialized in the reproduction of drawings by architects and whose cameragraphs of architectural renderings have been exhibited several times at the Architectural League, New York.

CALENDAR OF EVENTS

Jan.-Feb. 1	International Exhibition of Persian Art, Royal Academy, London.
Jan. 8	Underwater illumination. Demonstration of lighting of swimming pools. Illuminating Engineering Society. New York Athletic Club.
Jan. 12-16	American Road Builders' Association Convention and Road Show, St. Louis, Mo.
Jan. 13-16	Building Products and Equipment Exposition, Cleveland Public Auditorium.
Jan. 15	Nominations for Le Brun Traveling Scholarship should be received before this date by the committee, Room 530, 101 Park Avenue, New York City.
Jan. 15-30	Exhibition of cameragraphs by Palmer Shannon, photographer, at the Architectural League, 115 East 40th Street, New York City. Exhibits will include reproductions of architectural drawings and will show the work of New York renderers for the past year.
Jan. 16	Medal award dinner given in honor of Mr. Cass Gilbert at Hotel Astor, New York City, by Society of Arts and Sciences.
Jan. 23.	Beaux-Arts Annual Ball, Hotel Astor.
Jan. 24	Closing date for applications to the Steedman Memorial Traveling Fellowship, Washington University, St. Louis, Mo.
Feb. 1	Closing date for entries for Rome Prize competition. Apply to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park Avenue, New York City.
Through Feb.	Annual exhibition of the Architectural League of Greater Miami, Florida.
March 30-April 4	House and Garden Exposition, Grand Central Palace, New York City.
April	Second International Congress and Exhibition of Sanitary Engineering and Municipal Hygiene, Milan, Italy. For information, apply to the Secretary General, Congress Internazionale di Tecnica Sanitaria e di Igiene Urbanistica, Milano, Piazza del Duomo 17.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York City.
June 1-5	International Town Planning and Housing Federation Congress, Berlin.

C. Aerial Photographic Service

Trowbridge

THE FEBRUARY ISSUE

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STADIUM DESIGN
BY MYRON W. SERBY, STADIUM CONSULTANT

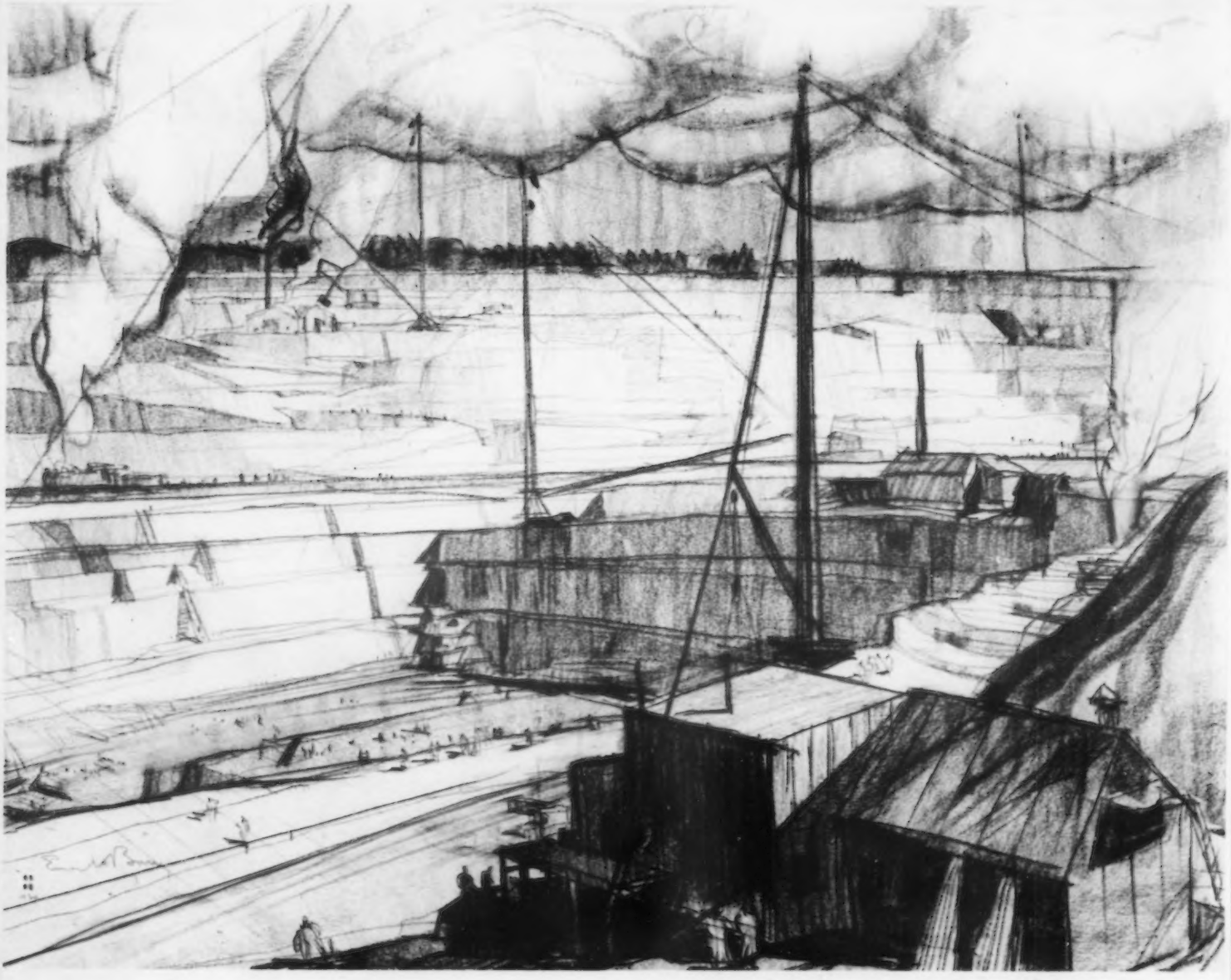
The many stadiums and grandstands erected to meet the increasing desire of the public for outdoor sports have witnessed the development of stadium design into a specialized practice. Features such as combination usage of the playing field for various games, orientation, drainage, construction of the stands and seats, nearness and clearance factors of good view, multiple decks for spectators and parked automobiles will be discussed in this article. Excellent photographs of recent projects will also be included.

WASHINGTON HALL, WEST POINT MILITARY ACADEMY
GEHRON AND ROSS, ARCHITECTS

As a mess hall seating hundreds of cadets this building is a recent addition to the West Point reservation. The hall is fitted to an irregular plot of ground and is itself a single vast room with two wings flanking a central kitchen and two serving pantries. The traditional Gothic style has been used to conform with the other buildings and barracks of the academy.

PUNCH AND JUDY THEATRE, CHICAGO
EUGENE FUHRER, ARCHITECT

This small cinema theatre is a remodeling of an older playhouse, the Central Theatre Auditorium, long a home of light opera and musical productions. Many changes have been wrought for the presentation of motion pictures. One of the two balconies has been eliminated and the other converted into loges. Obstructing columns of the old theatre have been concealed by the new construction, and the general plan rearranged to obtain greater compactness and better acoustical qualities. Interior decorations were designed by Nicolas Remisoff.



NEW EAST DEVELOPMENT

Number Four of a series of twelve drawings made at the Fletcher Quarries by Ernest Born.

GRANITE

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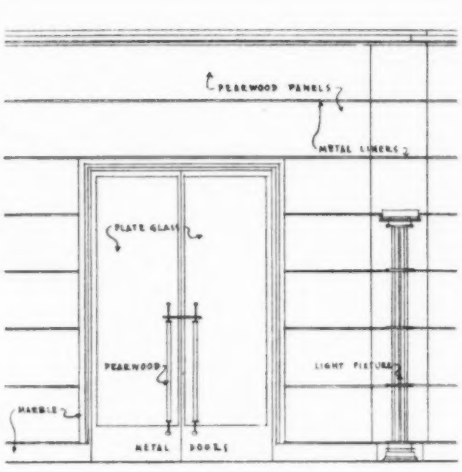
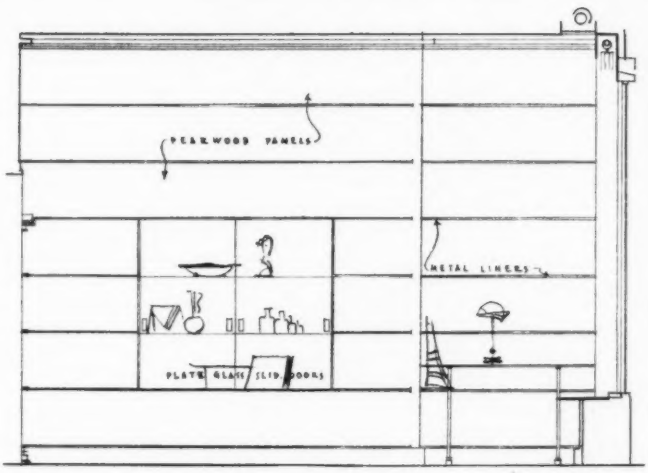
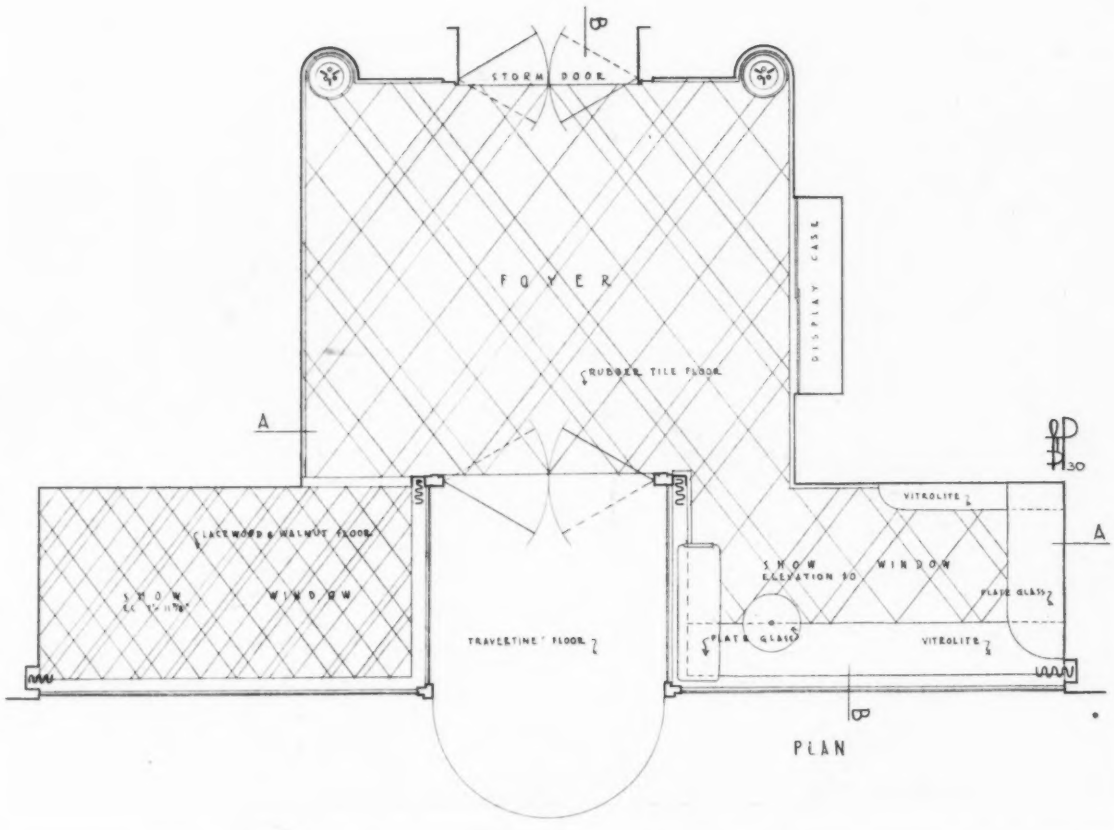
WEST CHELMSFORD MASS.



ELEVATION "A"



ELEVATION "B"



PLAN

L. P. HOLLANDER COMPANY
3 EAST 57th STREET, NEW YORK CITY
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Working details of main entrance and show windows. Openness of window permits view into foyer.

John Wallace Gilliat, Inc.

L. P. HOLLANDER COMPANY
3 EAST 57th STREET, NEW YORK CITY
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

West show window. Background paneled in pearwood. Inlaid floor. Working details on reverse side.

THE ARCHITECTURAL RECORD

AN ILLUSTRATED
MONTHLY MAGAZINE
OF ARCHITECTURE

VOLUME 69 NUMBER 1 JANUARY, 1931

L. P. HOLLANDER COMPANY STORE

JOCK D. PETERS, DESIGNER, COLLABORATING WITH ELEANOR LEMAIRE

PROBLEM

To design seven selling floors for a woman's specialty shop; to give a luxurious spaciousness conducive to leisurely selection; to preserve the architectural units and at the same time to satisfy the display and selling needs; to incorporate niches, shelves and illuminated display cases in the architectural treatment because such permanent displays are of utmost importance. Conditions imposed by the merchandising requirements include adequate space for stock and fitting rooms, both of which must be readily accessible to their departments.

PLANNING

The rules of the fire department governing fire exits demand that certain definite space be used on each floor for fire exits. Instead of permitting those exits to interfere with the floor layouts the floors were designed accordingly, giving layouts which help the merchant to present his merchandise with the least possible amount of customer resistance. The usual fixed island counters were not used; instead, the present plan, born of necessity, enables the management to handle the floor sales with the minimum amount of sales help.

ENTRANCE HALL

The narrow frontage is reduced further by the need for two special passages, one a service entrance, the other a fire exit. In order to avoid a shut-in appearance the display windows, varying in floor level, were designed with open backs to permit the horizontal pearwood panels of the foyer walls to pass through and to form the background for the display windows. The clear glass inner storm door allows an open view of the main floor.

Privacy in the selection of accessories and perfumes was found necessary. This need was met by designing two small rooms on either side of the entrance. The powder room adjoins the evening bag room; on the opposite side of the entrance is the small perfume room. These rooms are not entirely cut off from view of the shoppers inside the store because of the large circular window and the corner treatment of clear glass.

The wall cases are of beige lacquer finish with magnoliawood backing. The free-standing display and selling cases are of aspenwood with lacquer trim. The decorative red trim in the counter and display cases was employed to tie these various sections together.

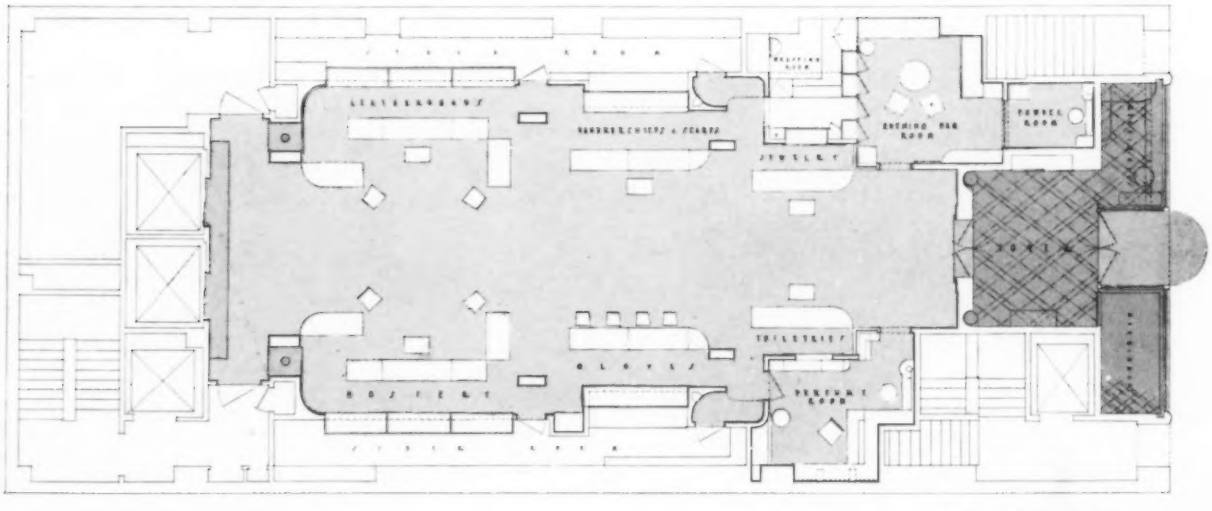
THIRD FLOOR

Sportswear. In this department zebrawood with formica inlay was chosen for the fixtures. The big sweep of over-all carpet, designed in blue and gold, contrasts with

John Wallace Gillies, Inc.

L. P. HOLLANDER COMPANY
3 EAST 57th STREET, NEW YORK CITY
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Entrance and show windows.



Ground floor plan.

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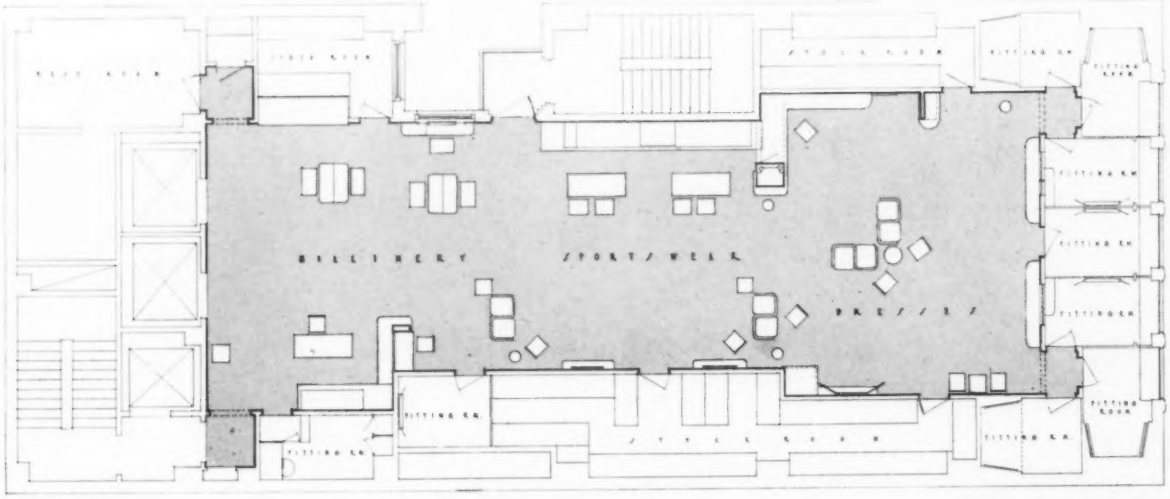
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Main floor, looking into perfume room, opposite evening bag room.



Plan of seventh floor.

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DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Fifth floor, ready to wear dress department. Recessed lighting fixtures in walls and ceilings.

the restful brown tones of the cork walls in the coat section. The open treatment of this floor, with its direct daylight, gives outdoor atmosphere.

FIFTH FLOOR

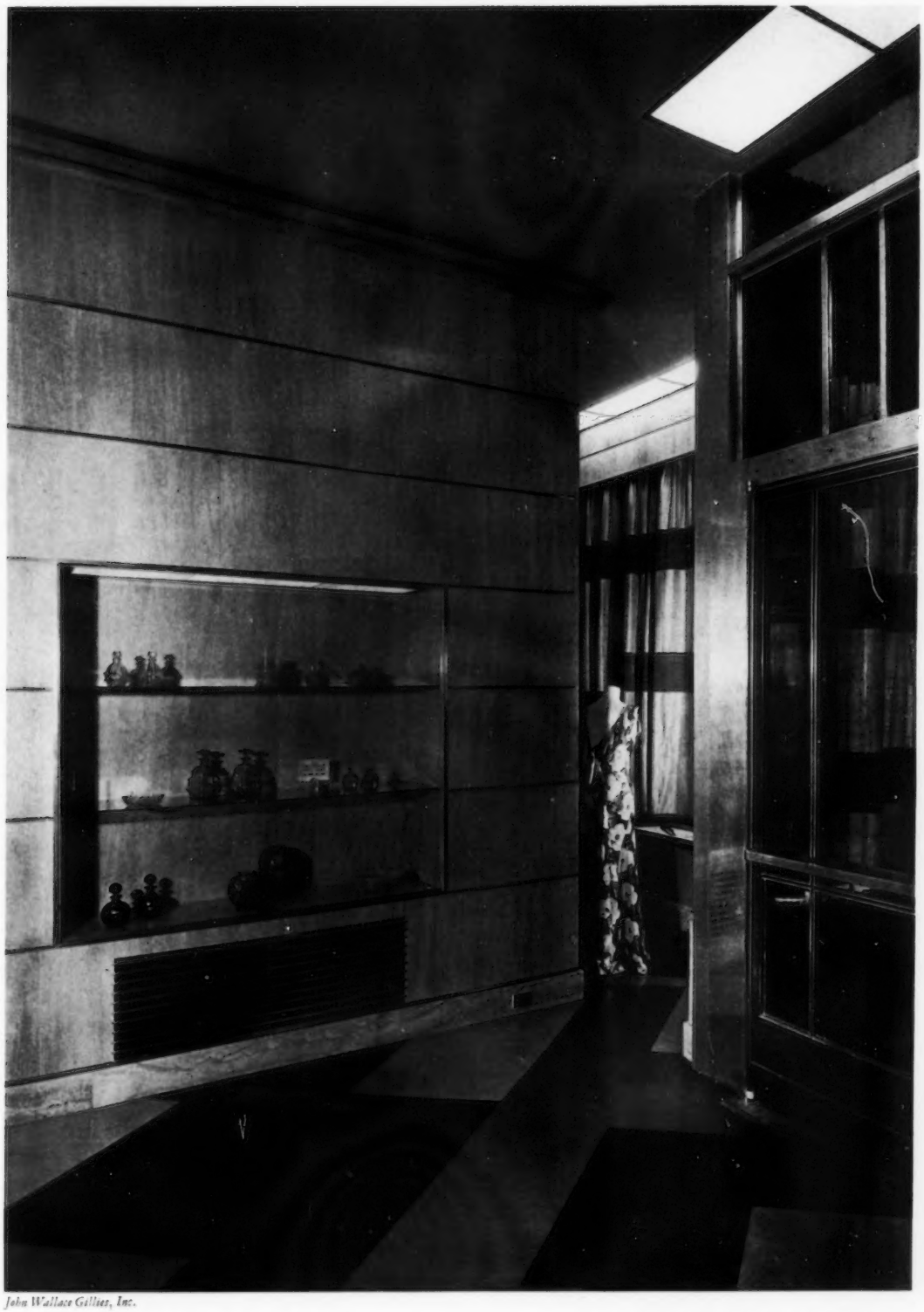
Ready to wear. The merchandising needs of this department demanded a very simple layout. Shelves of aspenwood are placed conveniently for the dress accessories.

SIXTH FLOOR

Custom dressmaking. The salon idea was used here to suggest leisurely, restful shopping. Walls of peach color and carpet of eggplant color add to the sense of quietness so conducive to the uninterrupted selection of models. Spacious selling rooms have been arranged for required privacy. Facilities for the showing of collections are provided for by means of a removable platform located at one of the archways; from this point the manikins may be seen to advantage from all parts of the room.

SEVENTH FLOOR

"*Debonnaire.*" This floor was set apart for college students. Instead of fixed departments with established walled units, the designs called for clearly defined architectural lines to give the necessary segregations. The walls and furniture are treated in black and white relying upon color notes for relief. The furniture is of metal.



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Looking from foyer into open show window. Walls of paneled pearwood with horizontal liners of Benedict nickel. Rubber tile inlaid floor.

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DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Elevator wall. Doors, casings and trim in varied finishes on Benedict nickel. Walls lined with Crocidolite marble.

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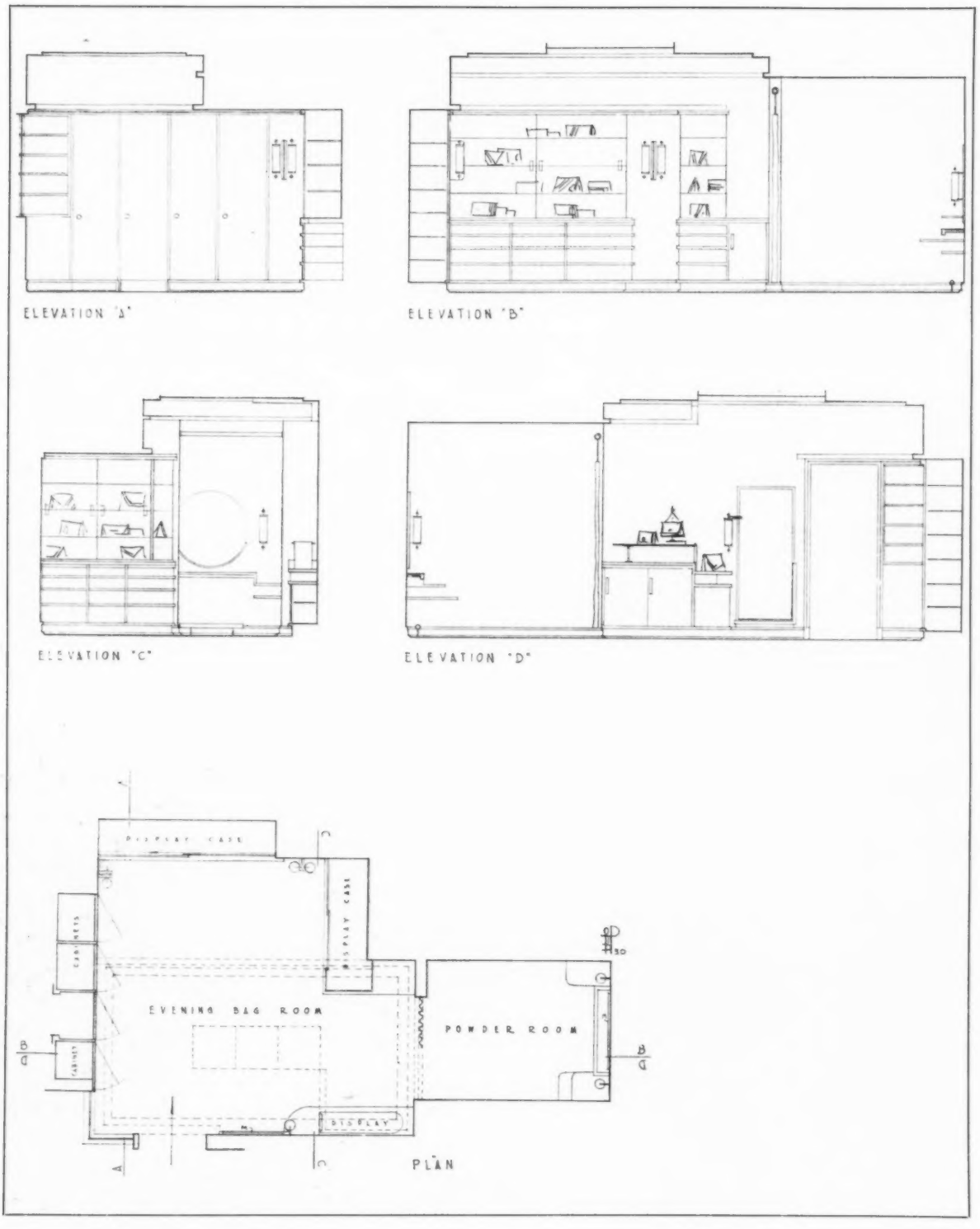
Main floor, inside accessory and evening bag room with adjoining powder room. Low display table with illuminated glass top.



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Working details of evening bag room, main floor.

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COLLABORATING WITH ELEANOR LEMAIRE

Main floor, looking into accessory and evening bag room. Corner treatment in clear plate glass with horizontal molds.

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COLLABORATING WITH ELEANOR LEMAIRE

Third floor, coat department. Walls of natural cork inlay. Wainscot panel in zebrawood with vermilion wood inserts.

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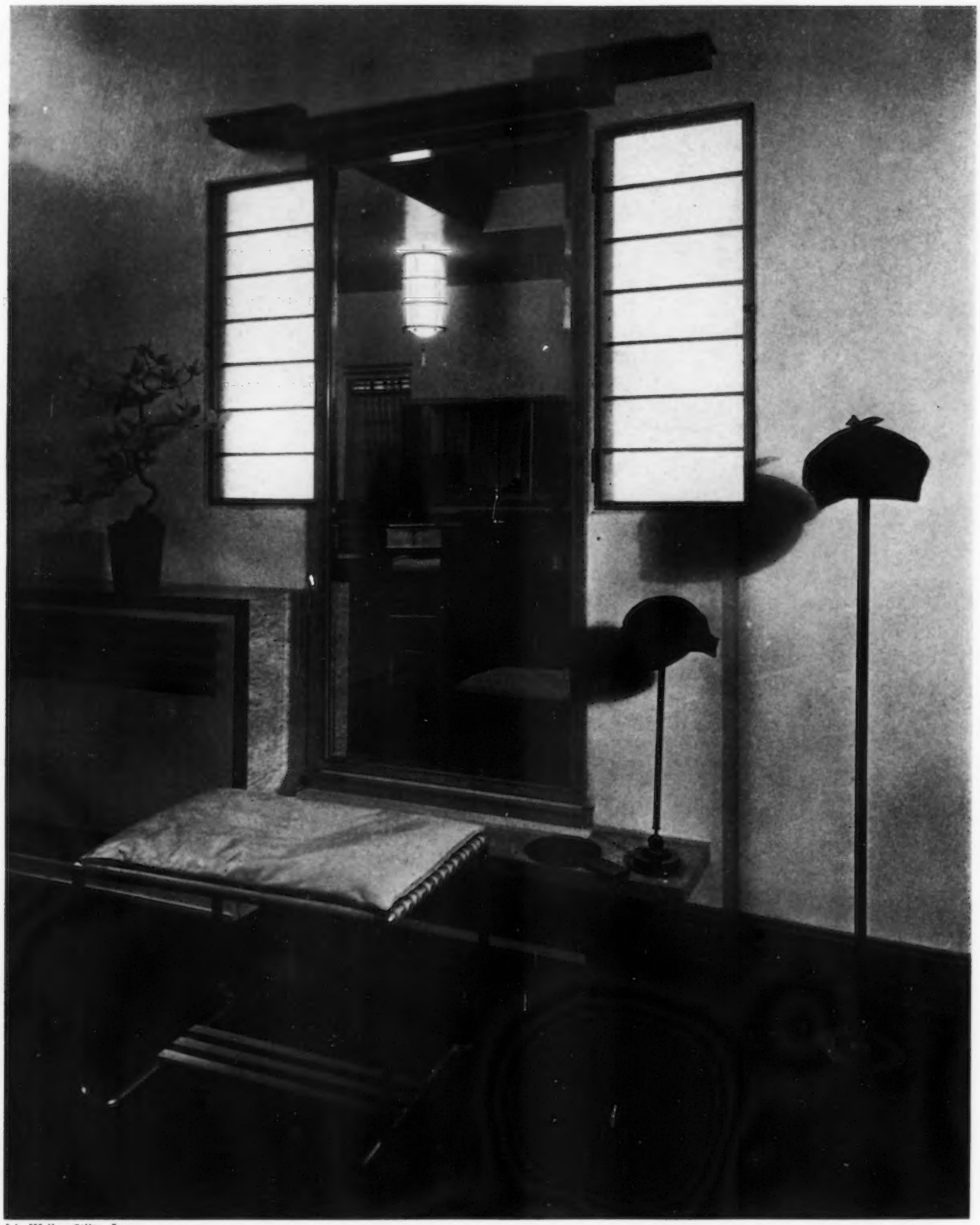
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Sixth floor, custom dress salon and display niche. Applied ornamental strips of Benedict nickel. Recessed display case.



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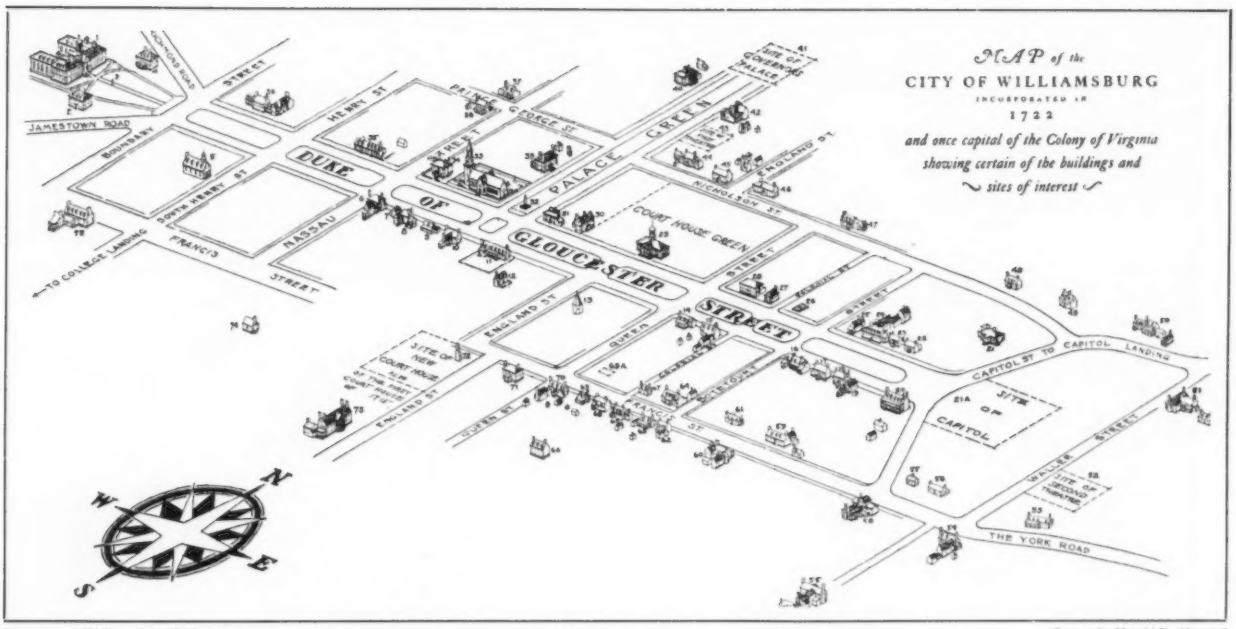
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Seventh floor, "debonnaire" shop. Millinery try-on mirror with concealed sidelights.

John Wallace Gillies, Inc.

L. P. HOLLANDER COMPANY
3 EAST 57th STREET, NEW YORK CITY
DESIGNED BY JOCK D. PETERS
COLLABORATING WITH ELEANOR LEMAIRE

Seventh floor, "debonnaire" shop. Millinery display case in English oak with lacquer trim.



Permission of Williamsburg Holding Corporation *Drawn by Harold R. Shurtleff*

THE EXCAVATIONS AT WILLIAMSBURG

The restoration of Williamsburg to its appearance in Colonial times, as to public buildings, residences, streets and gardens, is based on exhaustive research into documentary evidence both in this country and abroad and on extensive excavation and archaeological study of the site itself. The lapse of somewhat more than two centuries has brought about great changes in the aspect of the city, and during this time much of what actually exists in the way of records has been forgotten as well as what the earth may hold. Although for the most part the monuments are standing today, more or less altered in form, there are instances where only foundations remain, lying sometimes as deep as six feet below the modern grade. Preliminary to the restoration of any monument, all possible evidence of both a literary and pictorial character is gathered, the plaster is removed from the walls that may be standing and usually the whole site is laid bare by excavation. Minute examination of the existing walls and foundations determines which portions are original and reveals a wealth of information as to doors and windows, long ago filled in and lost beneath subsequent coats of plaster. Several distinct levels are often discerned which correspond to the periods of our history, and thorough excavation invariably brings to light many remains, such as unsuspected portions of the original building or subsidiary structures, all vestiges of which had disappeared. The documentary material and the evidence of the walls themselves, freed from the encumbering additions of later years, supplement and frequently verify each other, and with the remains uncovered by excavation lead to a full realization of the building as it once stood.

The archaeological work carried on in connection with the restoration may best be described in the specific instance of the "Wren" building of the College of William and Mary, where the results were most pertinent to a comprehensive understanding of that important monument. This was the first opportunity for any exhaustive archaeological study of the building, as it had been in almost continuous use since 1695; moreover, literary references of an architectural character are relatively few in number and barely outline its long and chequered history, while for certain periods they are non-existent. After the vines which practically covered the exterior walls had been cut away and the plaster on the walls of the interior had been entirely removed, there was brought to light a complicated variety of masonry representing a complete and unbroken archaeological history of the building from its foundation down to the present time. Upon close examination, the four periods of its building history were distinguished as well as certain minor operations that had taken place within these periods. The evidence confirmed the contemporaneous pictorial documents and explained several literary references that hitherto had not been quite clear. At certain points, the walls were laid

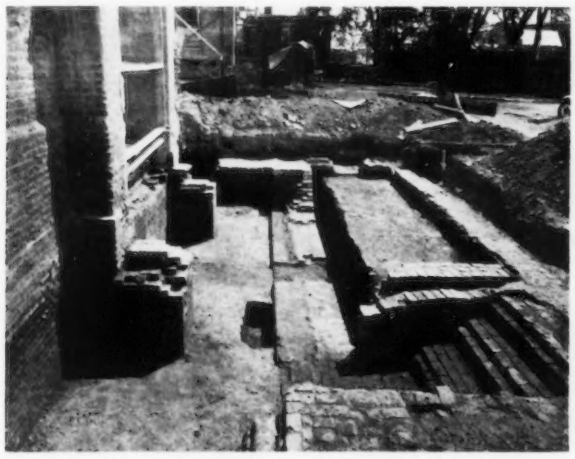
Editor's Note: The restoration of Williamsburg has been made possible through the generosity of Mr. John D. Rockefeller, Jr.; Perry, Shaw and Hepburn, Boston, are the architects; Todd and Brown, New York, are the contractors.

bare to their footings, and trenches were run to some distance in all directions to exhaust the possibility of evidence in the surrounding area.

The foundations of additions that had been made at various times were uncovered, as well as those of a portion of the first building which had apparently been buried since 1705. The latter remains represented a continuation of the north wing and gave the first indication that this wing had originally been longer; they were very well preserved and included a staircase which admitted to the basement of the north wing from the outside. In the south end of the building, the burnt wooden threshold of a doorway was found at some distance below the modern grade. The doorway was very important in the original building and is frequently mentioned in the literary references; after the fire of 1705 it was filled in and all evidence of it was lost. This threshold, indicating the original grade of the building, led to the establishing of the corresponding grade at the main entrance and to the subsequent solution of the difficult problem of the original entrance itself and its relation to the façade and to the plan of the building. The pavilion, at this point, though so carefully bonded into the wall that it appears to be contemporaneous with it, was found to be an addition resting in part on what would seem to have been supports for the original staircase. As a result of these discoveries, the only picture known of the first building, one that has long been held suspect by some scholars, was proved to be essentially correct. Four subsidiary structures mentioned in the literary references were found in the surrounding area, while at the rear between the wings an interesting discovery was that of the actual kilns in which the bricks for the building had been burned, verifying the statement in the building accounts that "the bricks were made on the spot."

The original or first building was considerably damaged by fire shortly after its erection and the second building received certain architectural additions, in particular the chapel or south wing, which corresponded to the wing on the north. In this form the building passed the greater part of its history and it is to this form that it is being restored, the internal evidence of the structure itself along with the information derived from excavation and research leaving no doubt as to an accurate restoration. The additions that represent the third and fourth periods, slight but nevertheless conspicuous enough to change the appearance of the building, have been removed. Before any demolition was begun, the building was photographed throughout, and as the work progressed, a complete photographic record of all evidence was maintained, including that revealed by excavation; likewise, a complete set of archaeological drawings was made showing the four periods and incorporating as well the remains that had been excavated. Every effort has been put forth to prevent the loss of evidence, whatever its period, while in the restored building a construction calculated to protect the original walls and to relieve them of all weight assures their preservation.

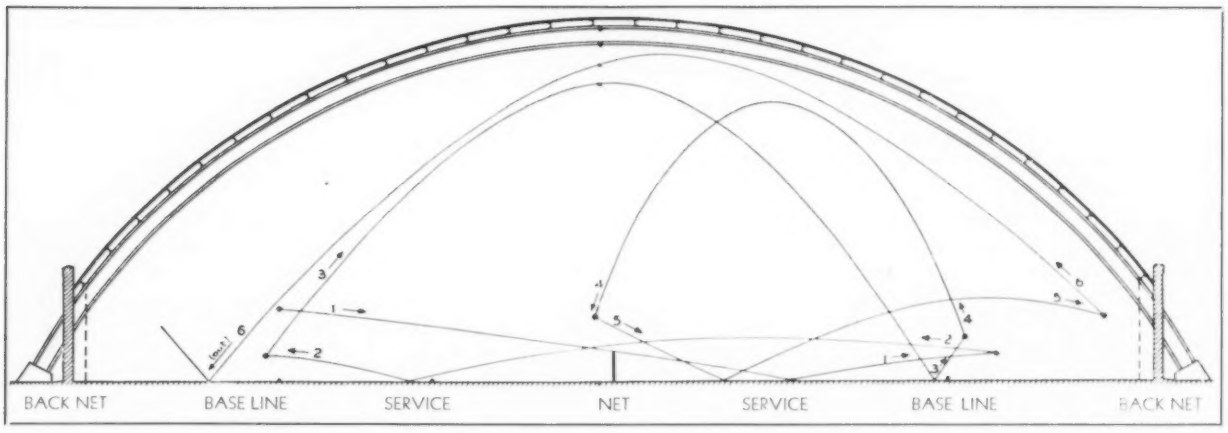
PRENTICE DUELL



Layton's Studio. Permission of Williamsburg Holding Corporation

THE WREN BUILDING
EXCAVATED AREAS

LEFT: AT FRONT OF BUILDING
ABOVE: AT REAR



CROSS-SECTION, TRAJECTORY TYPE OF INDOOR TENNIS COURTS BUILDING

Diagram shows how roof lines inclose space required normally in play. The flights of the ball during a rally with unusually high lobs and bounds are shown: 1. Serve; 2. Low return to mid-court; 3. Lob to back court; 4. Weak return, short to forecourt; 5. Smash to mid-court; 6. Attempted return, out beyond base line.

TRAJECTORY TENNIS COURT BUILDINGS

GAVIN HADDEN, CIVIL ENGINEER

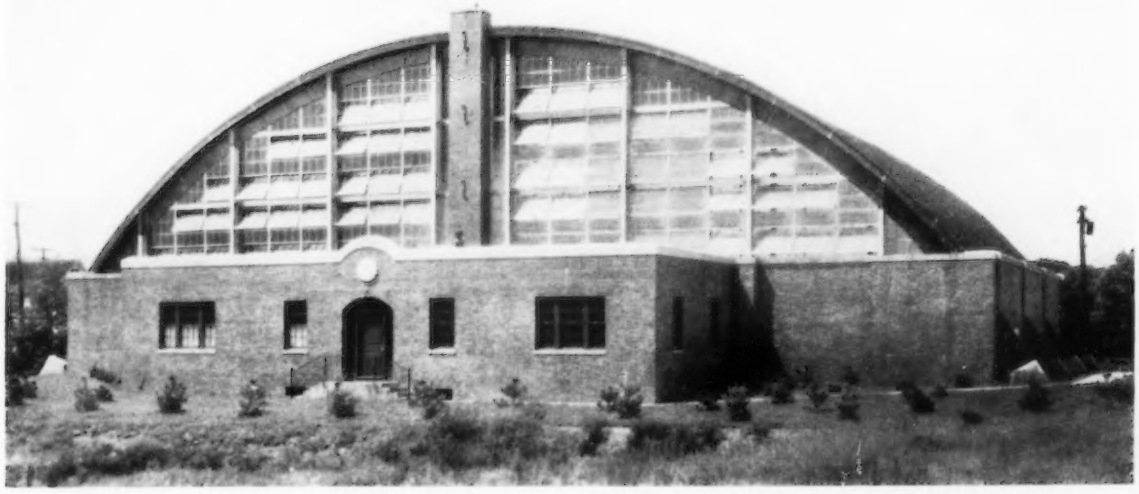
The most notable departure from orthodox ideas of design is the arching of the roof of the building lengthwise rather than transversely. Two major advantages are apparent at once: first, the possibility of constructing the side walls almost entirely of glass; and second, a maximum ceiling height at the center of the court, with a minimum at the ends and an equal ceiling height entirely across the court at any given point.

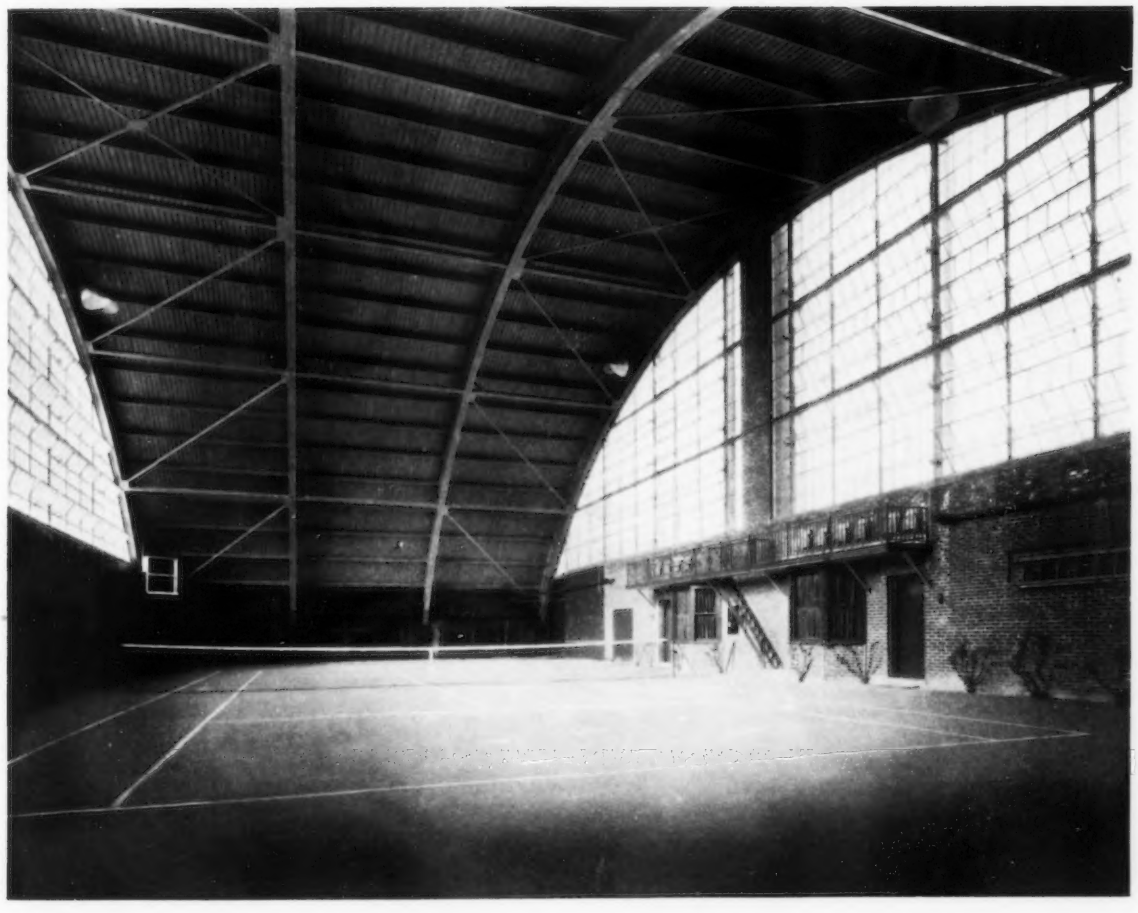
The sides of the building are enclosed with figured glass, and the playing area lighted entirely by natural light. There is no glare. In addition, the absence of skylights eliminates the confusing light and dark patches found in earlier tennis court buildings.

The adaptability of the longitudinal arching to the requirements of the game will be seen readily by a study of the longitudinal section. It should be noted that it was the game itself which really determined the shape of the building.

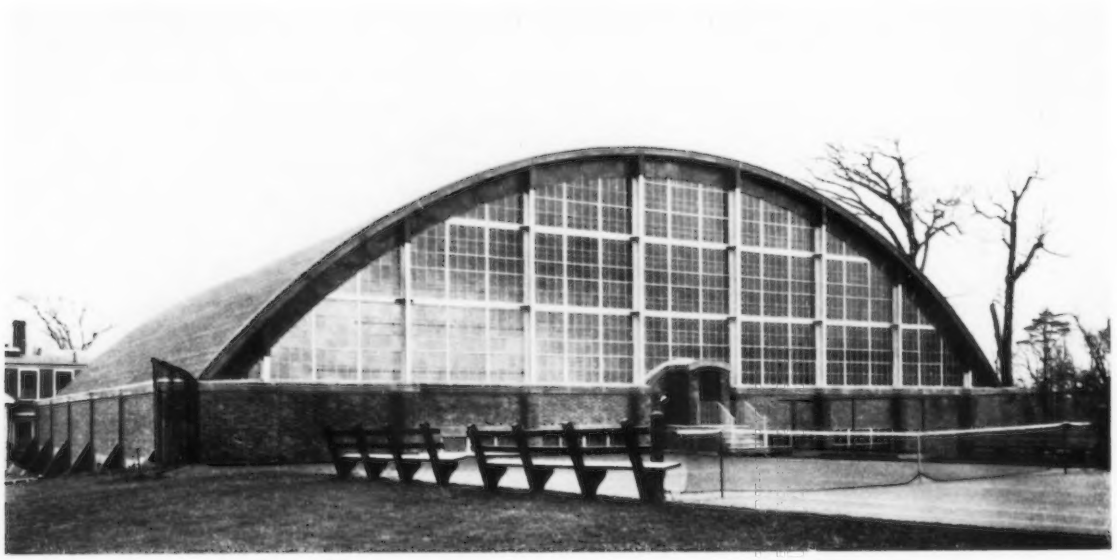
Other advantages and innovations are found in these tennis buildings. Among these is the application of aluminum paint to the upper part of the ceiling to give a background simulating outdoor conditions. At the ends of the courts green is used for a similar purpose. Artificial lighting, using almost any system, is usually installed for night play. This can be started with a minimum of lighting, costing little to operate, and increased in amount if desired, provision easily being made for future addition. Louvres at each end of the building allow air but no light to enter. The purlin channels are reversed so that they will not become ball traps.

Three buildings of this type have been built. Of interest is the fact that each court was built for a different type of client: the first, at Brookline, Mass., for a large country club; the second, at Beverly, Mass., for a small group of suburban residents; and the third, at Holmdel, N. J., for a single individual. The first encloses two courts, the others one court. The Brookline and Beverly courts are similar in that both have a clay playing surface which is at the general level of the surrounding ground. The Prentice court at Holmdel is sunk 8 feet below the average level of the ground outside and has for its playing surface a special type of floor with a cork carpet, laid so as to give uniformity and the correct amount of resiliency. All the buildings have cantilevered balconies for the convenience of a small number of spectators. The court at Brookline has two, one at each side, with umpire chairs suspended from the balconies on the center line of the courts. Dressing facilities for the Brookline court are provided in a separate building; for the other courts additions to the main building were constructed to house these and other facilities. The Beverly court, for instance, in addition to locker and shower rooms for men and women, has a club room of comfortable size with a large open fireplace, a separate telephone room and a kitchenette.

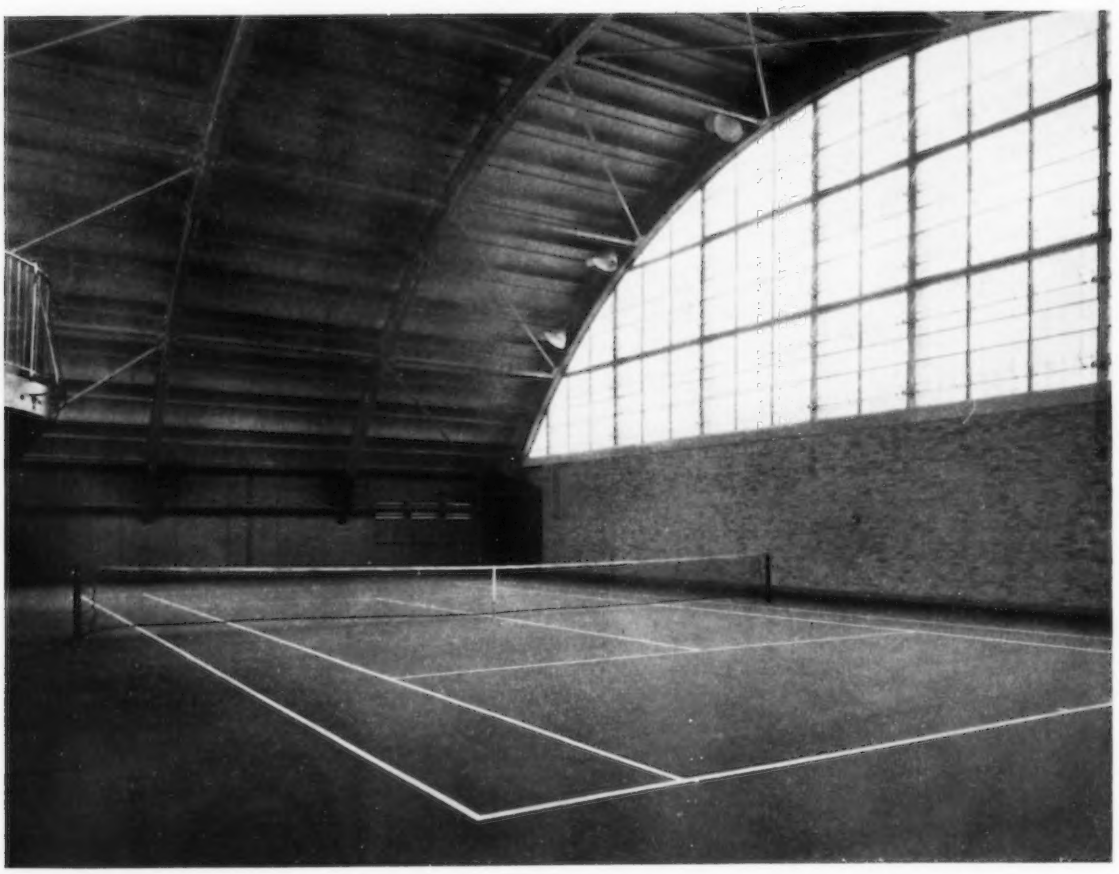




TRAJECTORY TENNIS COURT BUILDING
BEVERLY, MASSACHUSETTS
GAVIN HADDEN, ENGINEER



BROOKLINE, MASSACHUSETTS



PRENTICE COURT
HOLMDEL, NEW JERSEY
GAVIN HADDEN, ENGINEER

PORTFOLIO OF OFFICE INTERIORS

Charles Latere

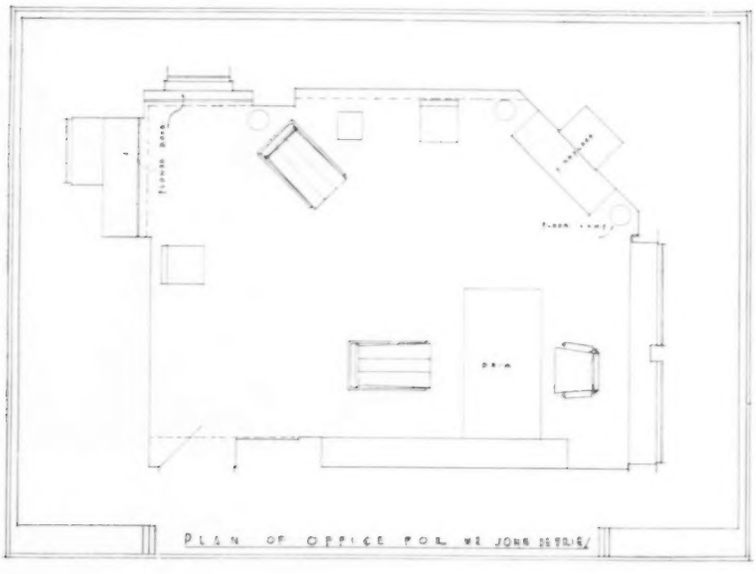
ADVERTISING OFFICES OF LENNEN AND MITCHELL
PRIVATE OFFICE OF JOHN DE VRIES
NEW YORK CITY
PERCIVAL GOODMAN, INC., ARCHITECTS

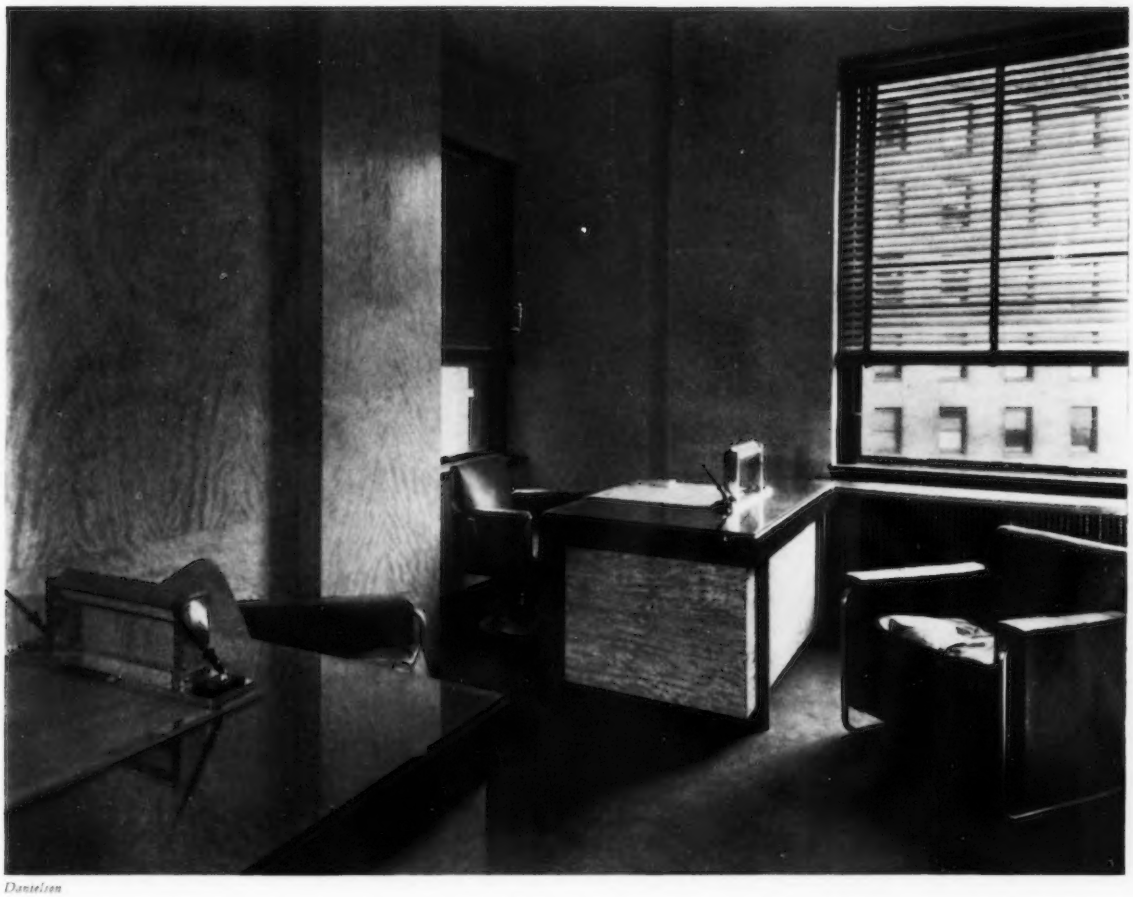
Walls in plaster, painted pale yellow. Ceiling white. Covers in tan and dark brown. Floor carpeted in black. Desk in black bakelite. All metal work of high polish nickel.

Charles Lazzeo

ADVERTISING OFFICES OF LENNEN AND MITCHELL
PRIVATE OFFICE OF JOHN DE VRIES
NEW YORK CITY
PERCIVAL GOODMAN, INC., ARCHITECTS

Chairs upholstered in tan and brown. Flower box under windows in high polish nickel plate and brilliant red.

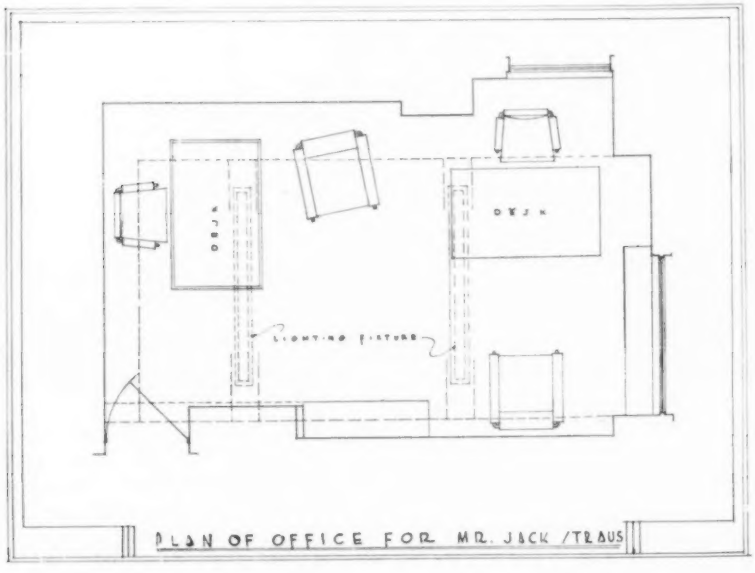


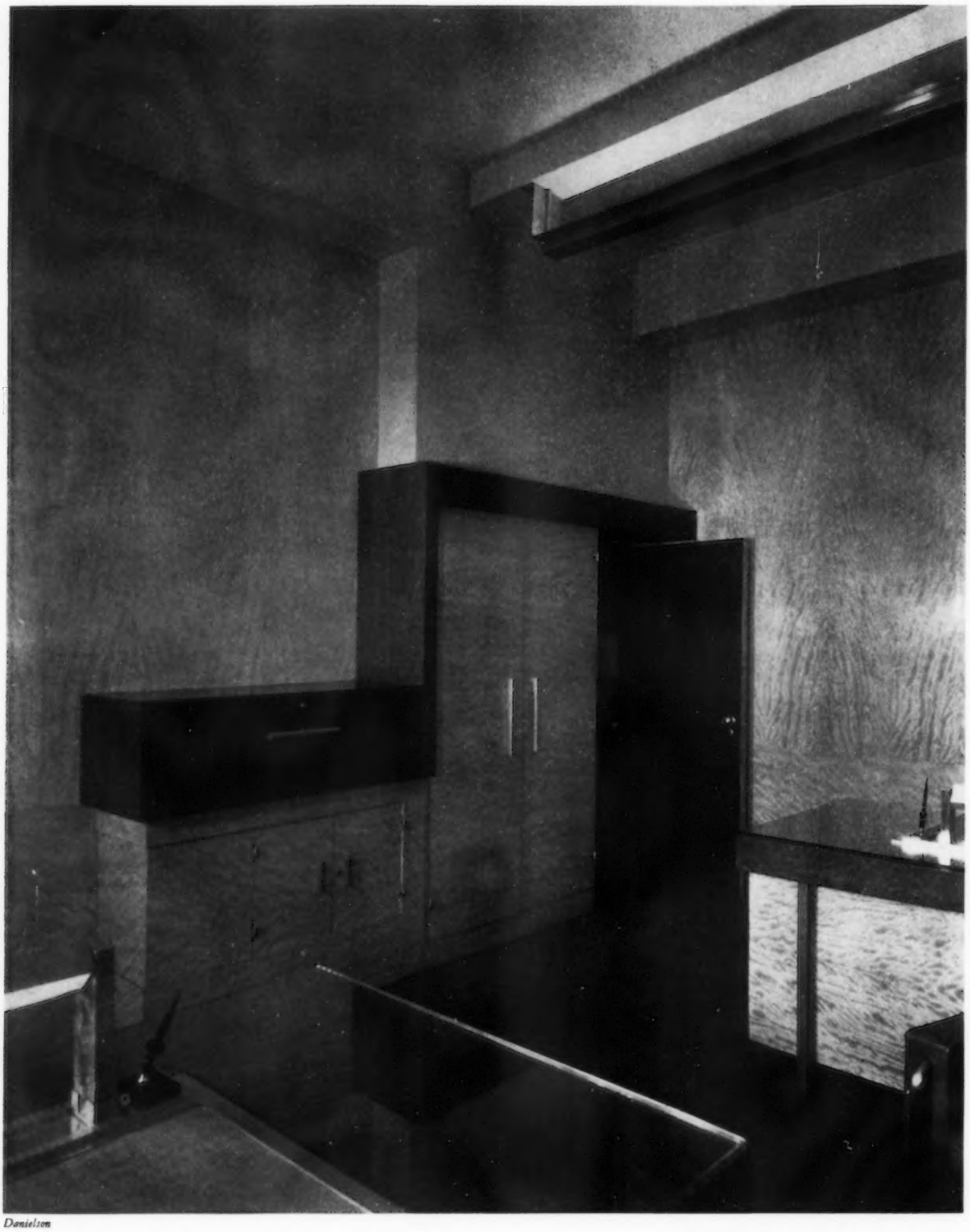


Dantelson

BROKERAGE OFFICES OF STRAUS AND COMPANY
NEW YORK CITY
PERCIVAL GOODMAN, INC., ARCHITECTS

Floors carpeted in brilliant green. Furniture upholstered in leather, same color as carpet.

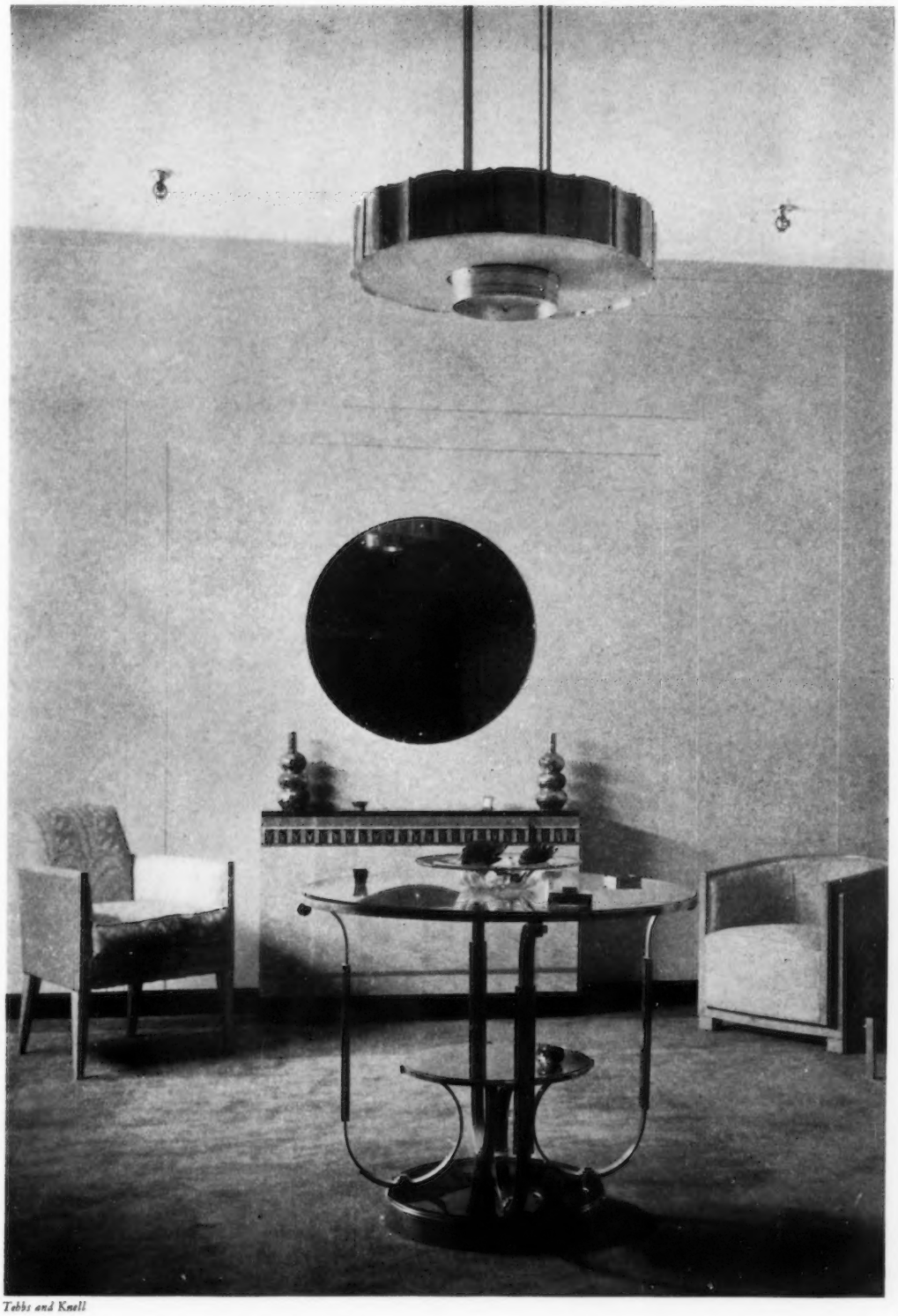




Danielson

BROKERAGE OFFICES OF STRAUS AND COMPANY
NEW YORK CITY
PERCIVAL GOODMAN, INC., ARCHITECTS

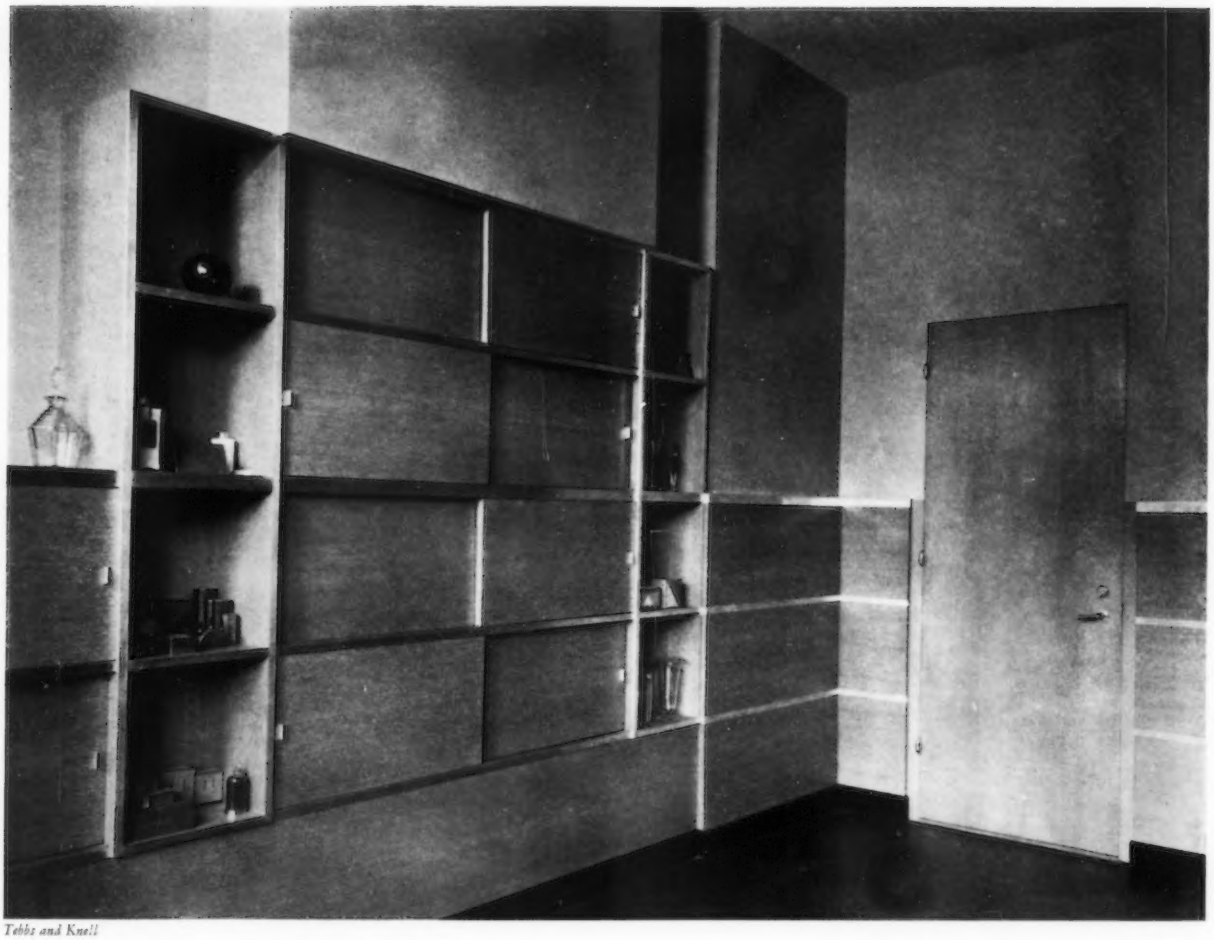
Walls paneled in Avoidire (light yellow). Built-in cupboards in redwood burl (dark brown red). Furniture same wood as walls. Metal work of dull nickel plate; fixtures same as metal.



Tubbs and Knell

PERFUME SHOP OF BOURJOIS, INC.
NEW YORK CITY
THOMPSON AND CHURCHILL, ARCHITECTS

Reception room. Walls green with silver edging. Ceiling cream. Carpet two tones of gray-green.



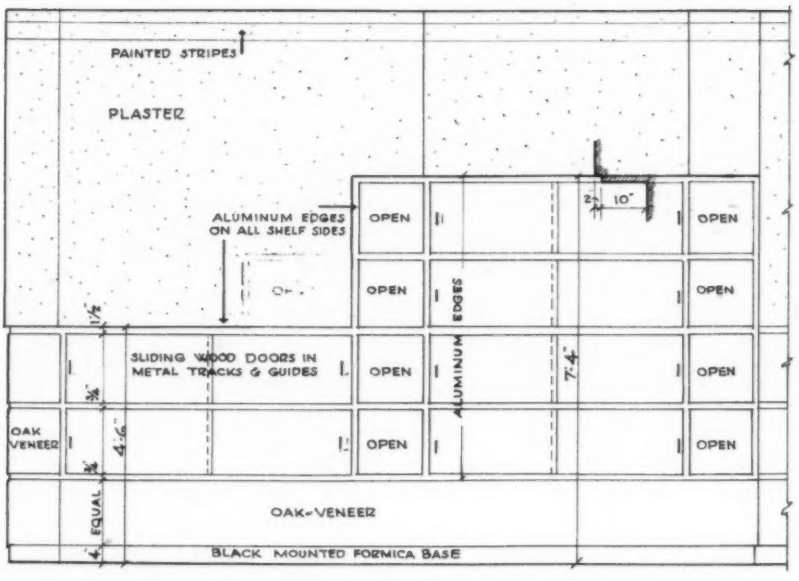
Tebbs and Knell

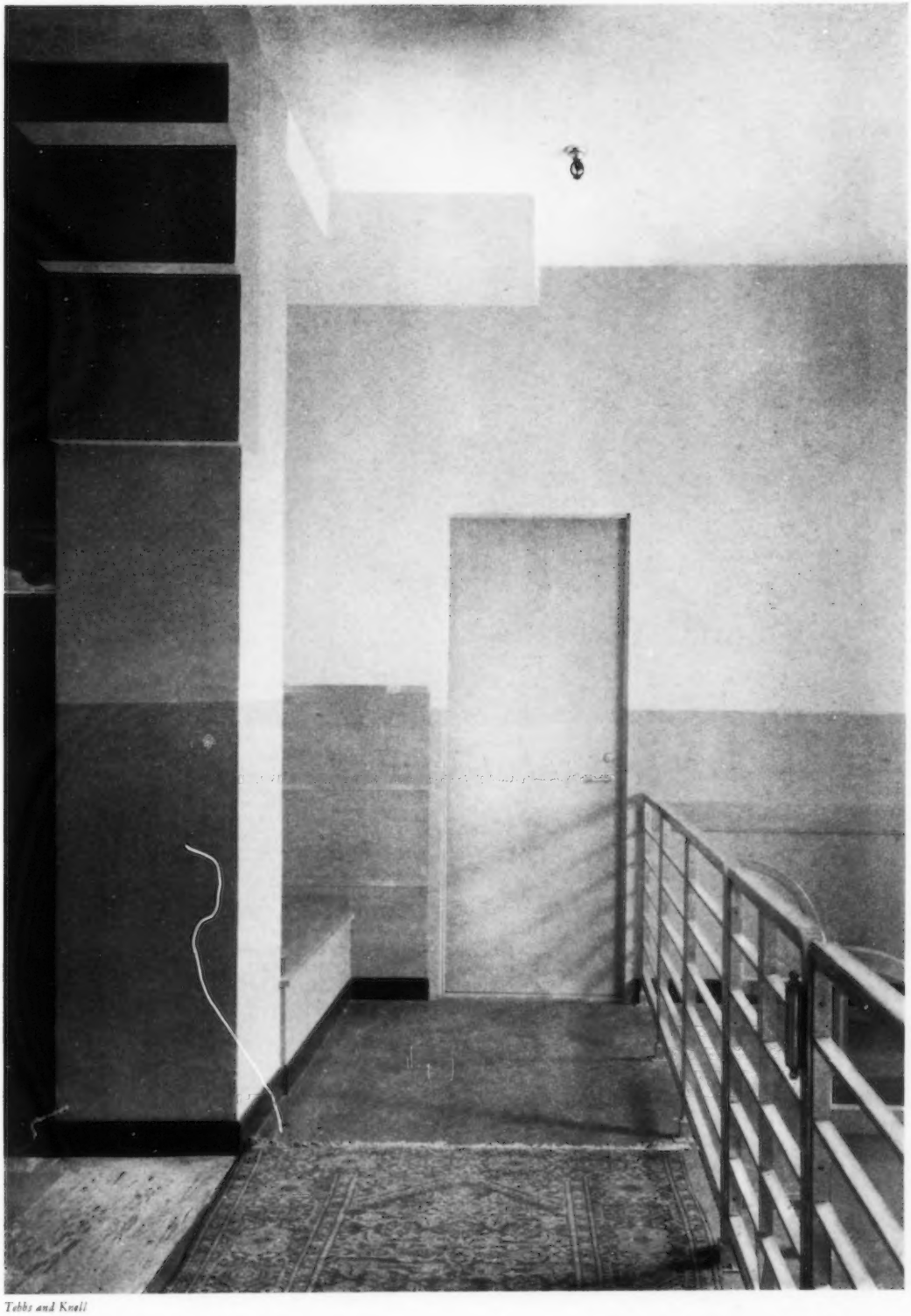
PERFUME SHOP OF BOURJOIS, INC.

NEW YORK CITY

THOMPSON AND CHURCHILL, ARCHITECTS

Cabinets and wainscoting in natural oak and aluminum. Flush panel door of oak. Green battleship linoleum floor.





Tebbs and Knell

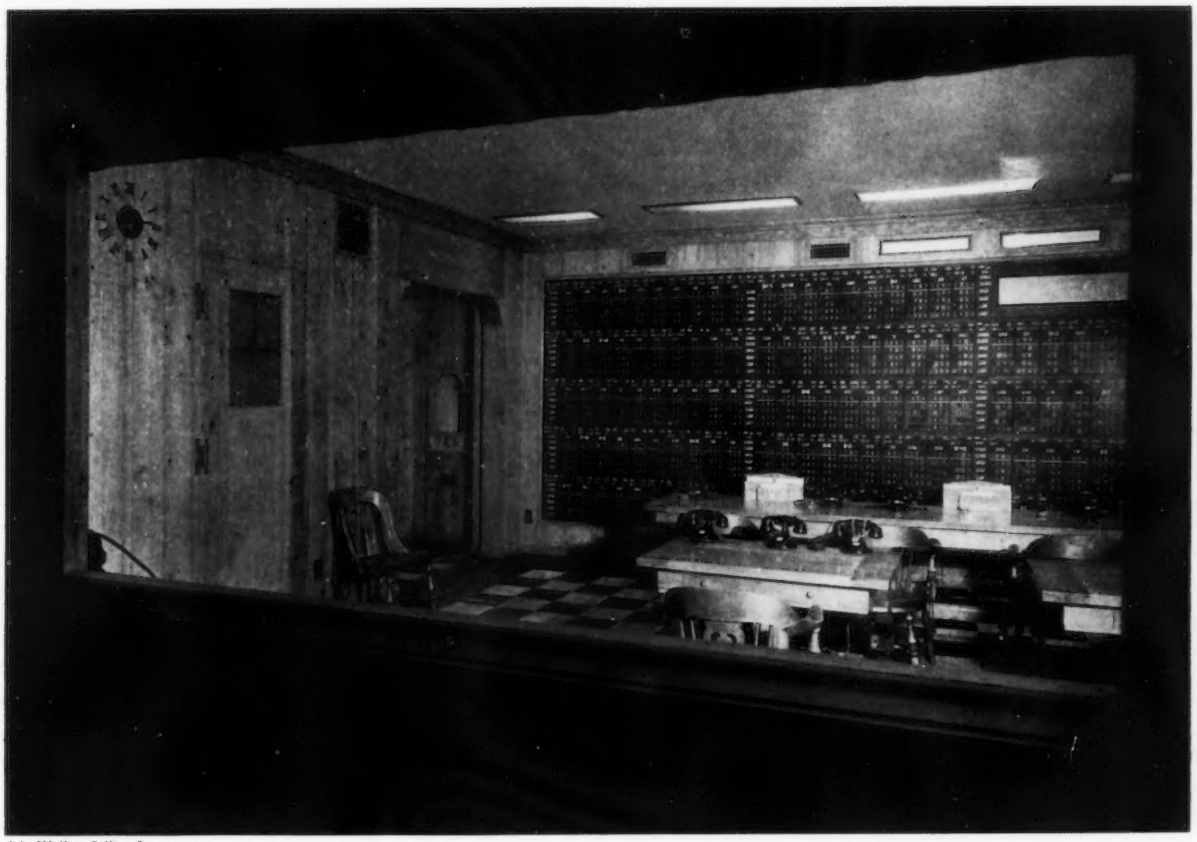
PERFUME SHOP OF BOURJOIS, INC.
NEW YORK CITY
THOMPSON AND CHURCHILL, ARCHITECTS

Rail of chromium and aluminum.

John Wallace Gillies, Inc.

GRUNTAL, LILIENTHAL AND COMPANY
NEW YORK CITY
EDWARD I. SHIRE, ARCHITECT

Board room of brokerage office.



John Wallace Gillies, Inc.

NEWBURGER, HENDERSON AND LOEB
NEW YORK CITY
EDWARD I. SHIRE, ARCHITECT

Board room of brokerage office as seen from margin room.

Rittase

INTEGRITY TRUST COMPANY
PHILADELPHIA
PAUL P. CRET, ARCHITECT

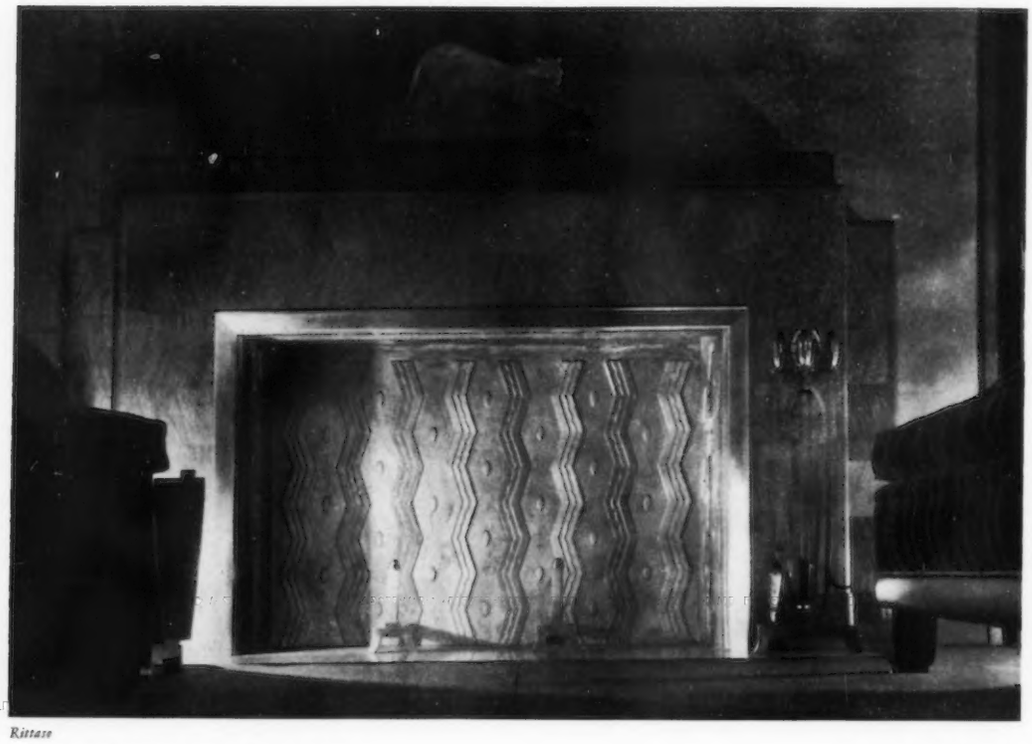
President's office.

Kittase

INTEGRITY TRUST COMPANY
PHILADELPHIA
PAUL P. CRET, ARCHITECT

Board of directors' room.

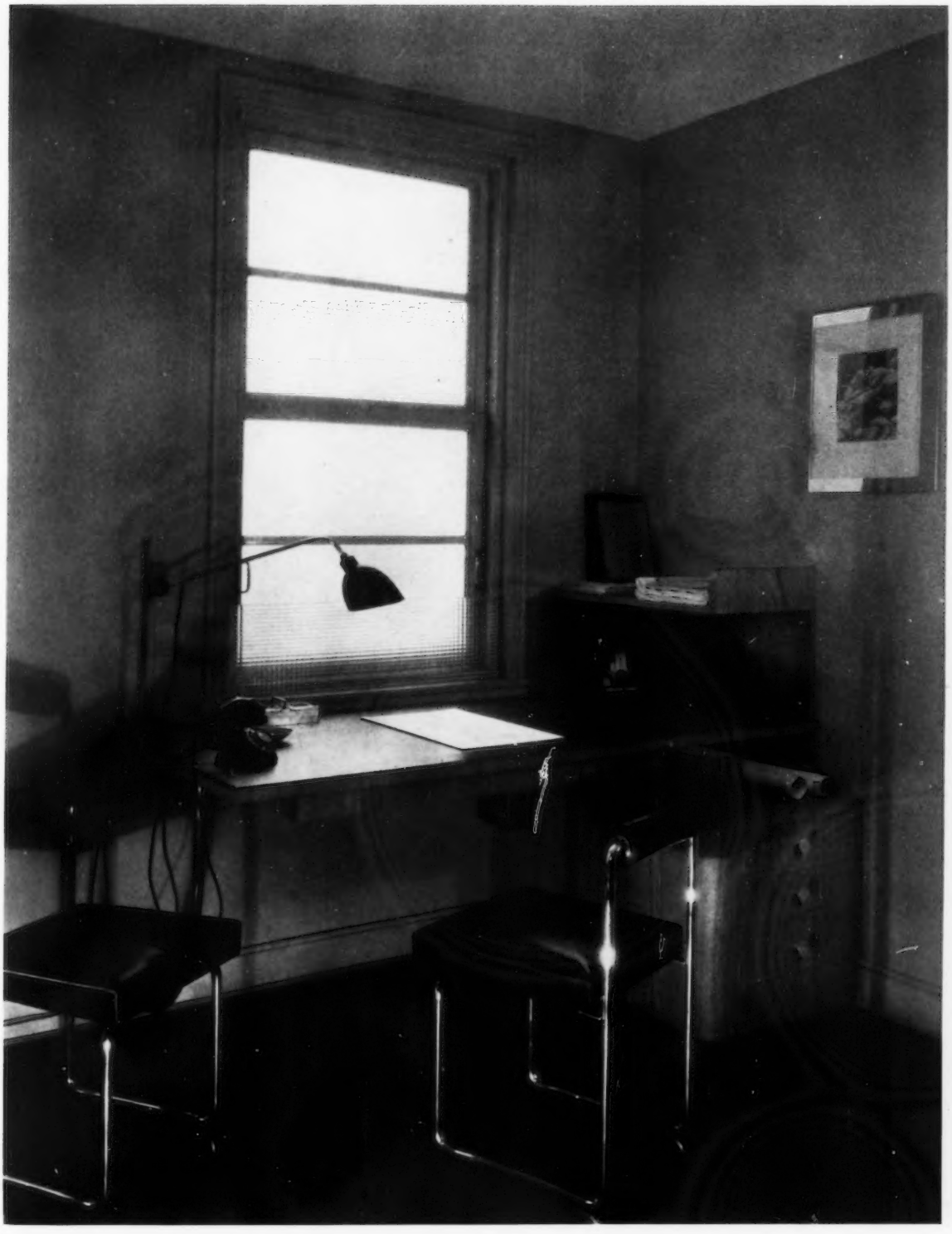
Board of directors' room.



Rittase

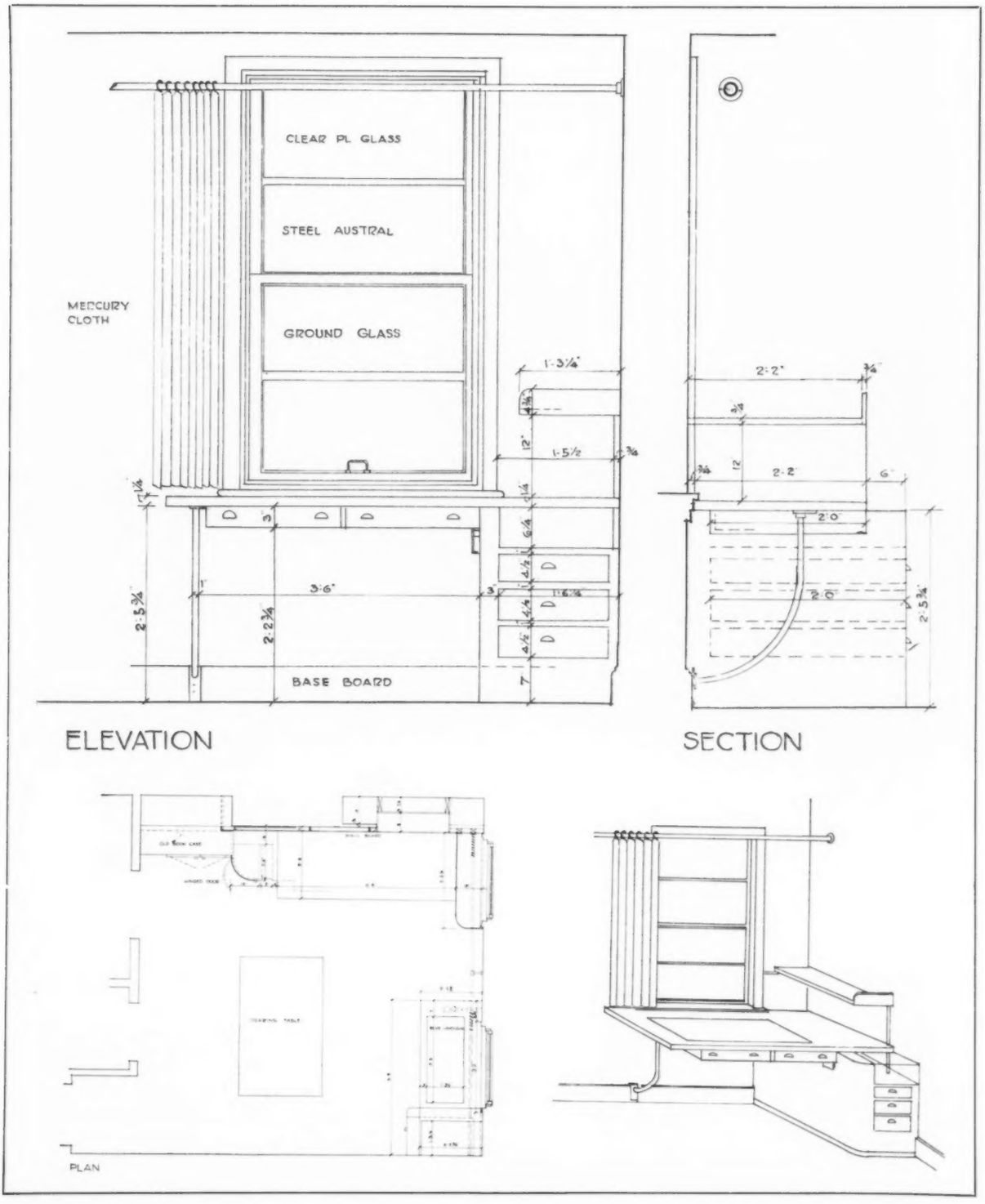
INTEGRITY TRUST COMPANY
PHILADELPHIA
PAUL P. CRET, ARCHITECT

President's office.



PHILADELPHIA OFFICE OF
HOWE AND LESCAZE, ARCHITECTS

Working details of this desk are shown on next page.



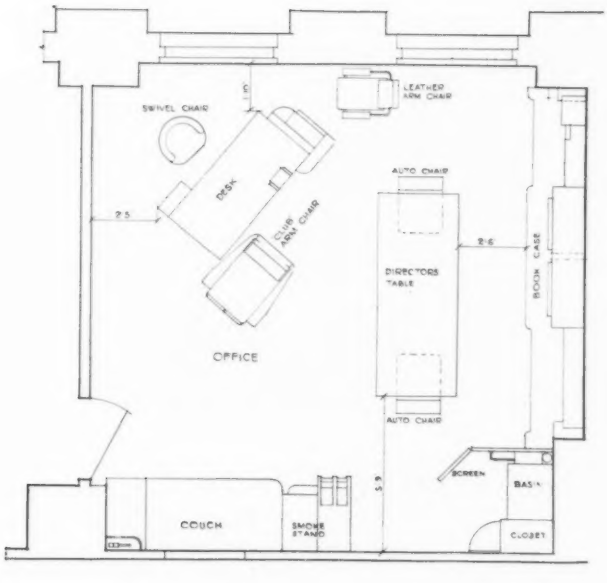
PHILADELPHIA OFFICE OF
HOWE AND LESCAZE, ARCHITECTS

Working details of writing desk.

Louis Condax

OFFICE OF WILLIAM STIX WASSERMAN
PHILADELPHIA
HOWE AND LESCAZE, ARCHITECTS

Board of directors' room.



Klette photo

WRITING DESK IN MODEL HOUSE AT BRESLAU, GERMANY
HEINRICH LAUTERBACH, ARCHITECT

Bonney

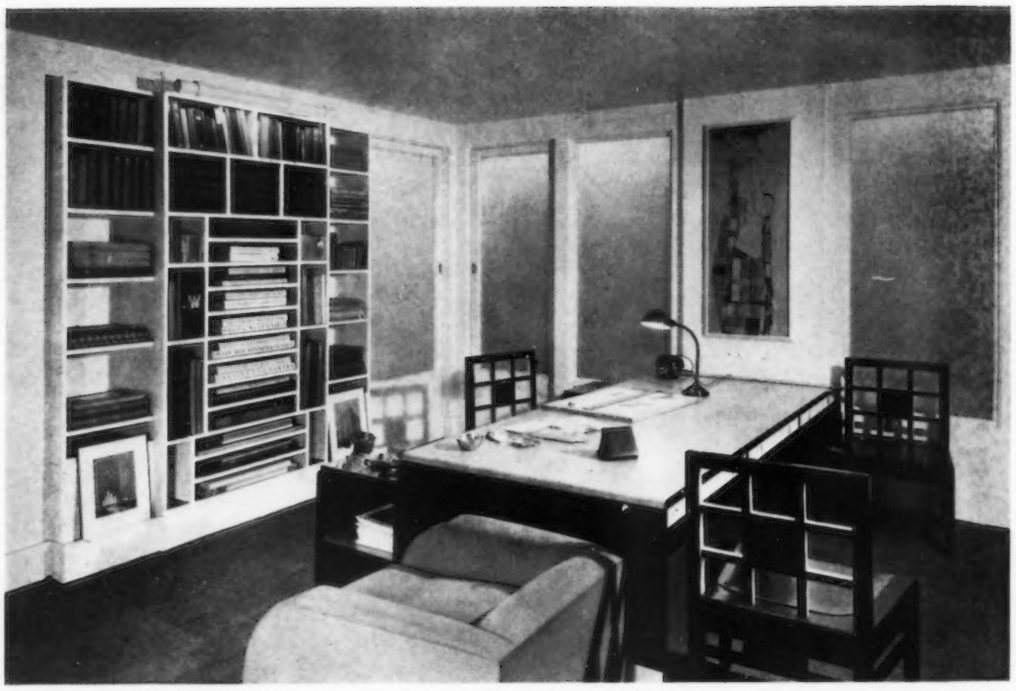
STUDIO CORNER OF HOUSE IN PARIS
DESIGNED BY SOGNOT

Furniture of mahogany and silvered metal. Chairs upholstered in red horsehair.

Nyholm and Lincoln

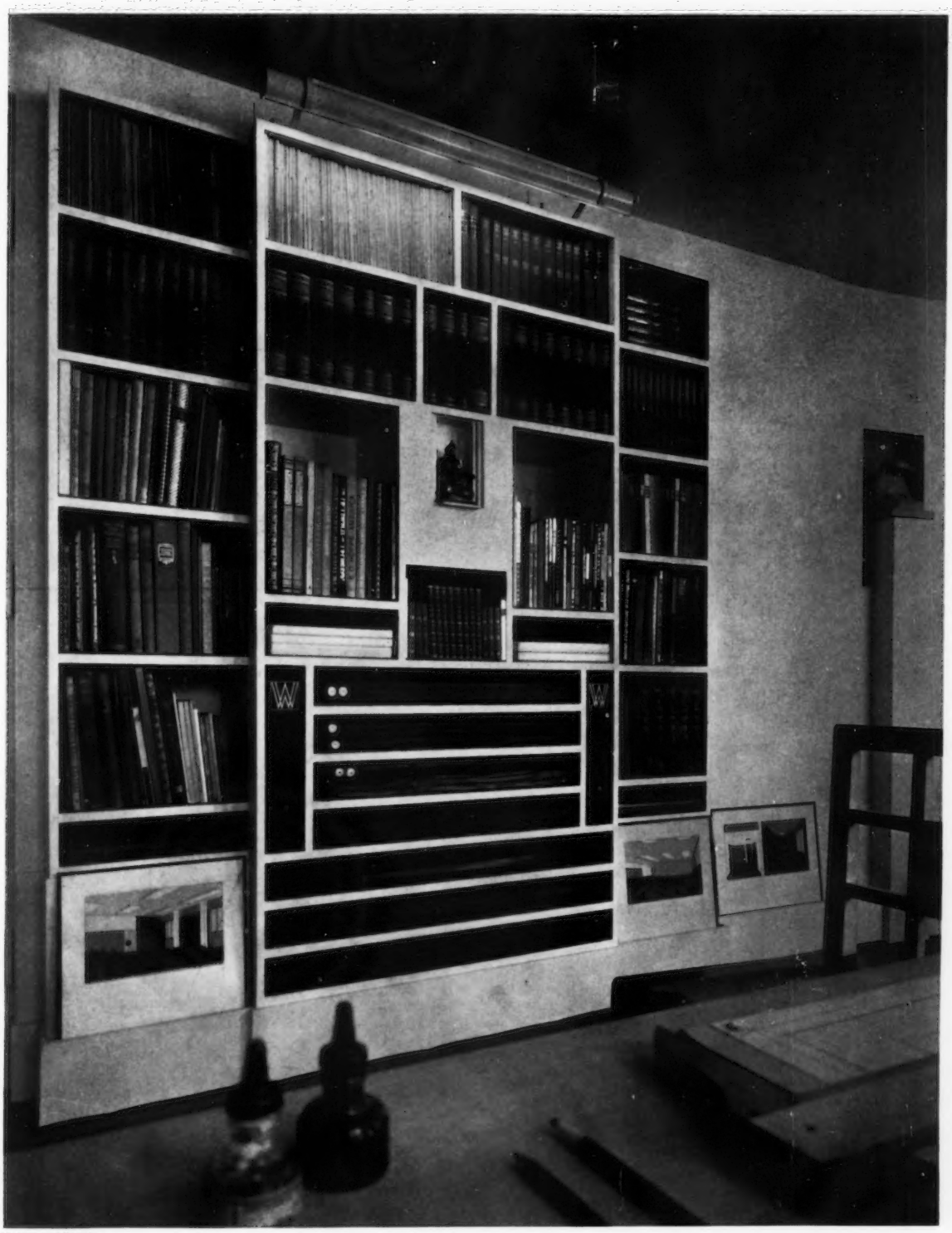
RECEPTION ROOM
OFFICE OF JOSEPH URBAN, ARCHITECT

Color scheme in black and white. Doorways and niches framed by black beaded molding.



Nyholm and Lincoln

PRIVATE OFFICE AND LIBRARY
OFFICE OF JOSEPH URBAN, ARCHITECT



Nyholm and Lincoln

PRIVATE OFFICE AND LIBRARY
OFFICE OF JOSEPH URBAN, ARCHITECT

Color scheme in black and white. Red vermilion suede cloth upholstery for chairs.

Cameragraph by Palmer Shannon

OIL RENDERING
BY CHESLEY BONESTELL
50-STORY BUILDING
AT 570 LEXINGTON AVE.,
NEW YORK CITY
CROSS AND CROSS,
ARCHITECTS

REPRODUCING ARCHITECTS' RENDERINGS

By PALMER SHANNON

Sketches and renderings have always been of great value to the architect in conveying his ideas to others. There is a constant need for perspectives and details of office buildings, banks, residences, schools and churches, particularly of buildings so situated that the camera has small chance to show them to advantage.

Duplicates—not mere photo-copies but reproductions that rival the originals in perfection—are of obvious value to the architect. In presenting a new project to a committee he is not limited to his original rendering but may have as many "originals" as he desires. Duplicates are also needed for purposes of record and publicity.

The draftsman, renderer or artist who makes the perspectives should keep in mind several considerations which will assist him in making the sketches more suitable for reproduction.

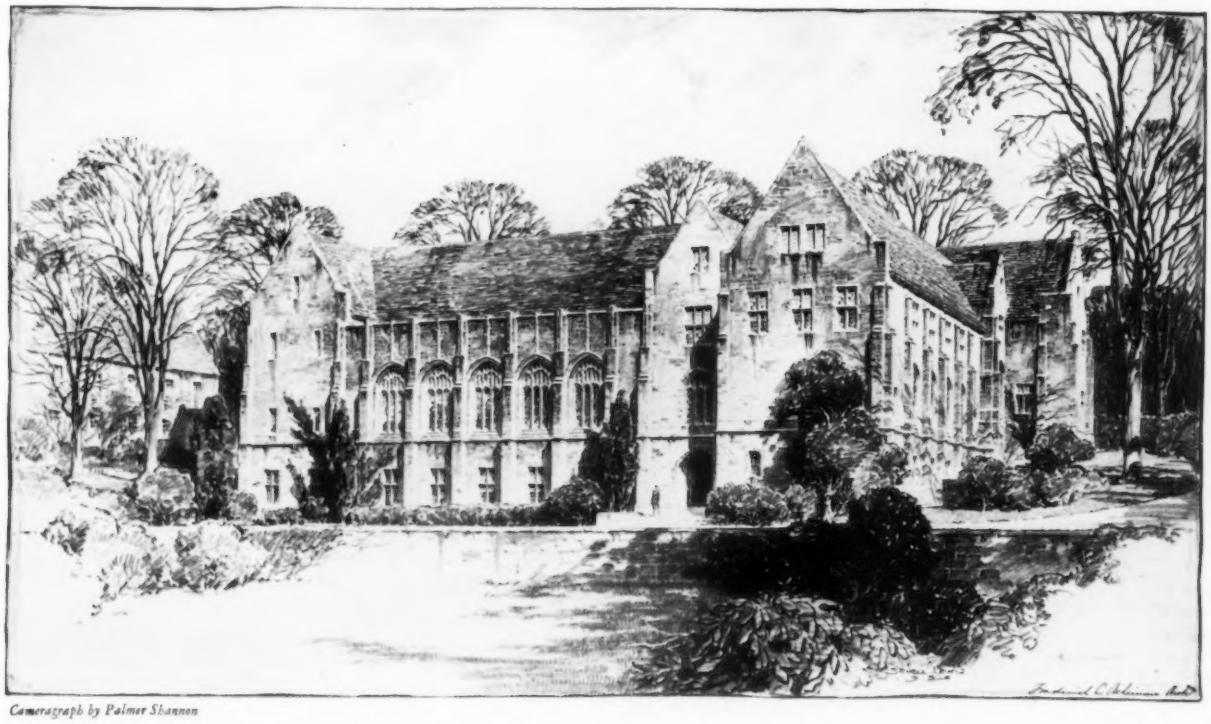
PAPER

Paper is the first thing to consider in making a black and white rendering which is to be reproduced. If tracing paper is used, it is desirable that the surface be white. There are many grades of so-called white tracing paper, but a dead-white tissue without any glaze is essential. If a very thin tracing paper is chosen with the intention of floating it when finished, the mount should be white and the best grade of transparent paste used. The tone of a reproduction of a tracing paper rendering will be a shade better if it is reproduced before the drawing is mounted. A good method of mounting is to use cement outside the margin of the drawing; in this way it can be reproduced as well after mounting as before.

If working on drawing paper or board, it is well to keep to dead-white surfaces. A fine combination for reproduction, however, is cameo paper and carbon pencil. Gray or colored papers are advantageous only when certain effects are desired, e. g., a white building on a dark background (pencil and chinese white on a gray or brown paper). Needless to say, the cleaner the drawing, the cleaner the reproduction.

FIXATIF

It is very important that a fine quality fixatif be used correctly, that is, applied smoothly. This



Cameragraph by Palmer Shannon

GRAPHITE PENCIL SKETCH ON TRACING PAPER BY SCHELL LEWIS
FREDERICK L. ACKERMAN, ARCHITECT

Cameragraph by Palmer Shannon

CRAYON DRAWING AND DESIGN BY HUGH FERRISS

point should be accentuated, as many drawings have been made unfit for good reproduction by faulty or careless fixing.

MEDIUMS

When pencil is the delineating medium, the drawing should not be excessively light and delicate. In the use of graphite pencil, care should be taken to avoid making a surface that causes a sheen or reflection. For heavy dark effects, a carbon, litho or some similar pencil is best for reproduction.

The strong line of pen-and-ink is relatively simple to reproduce.

Charcoal or black crayon may be used to the fullest range of tone values and will reproduce identically.

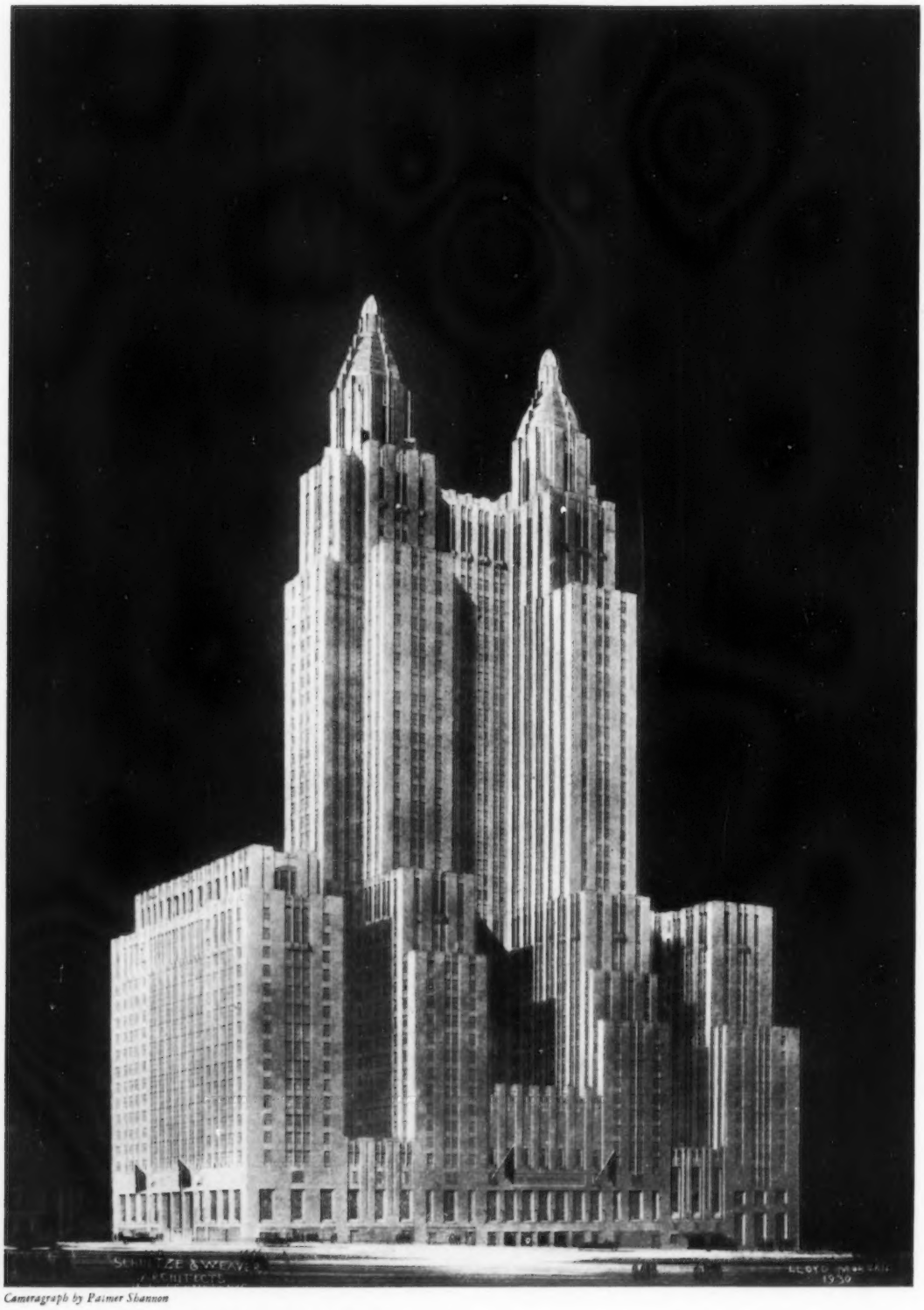
With water color, tempera, oil or other color media great care should be taken to get correct tone values. Color means nothing. A bright red placed beside a blue will not serve its purpose of contrast if the tone value of the red is the same as the tone value of the blue. Too little study is given to this subject by the beginner in color rendering. A *good* wash drawing is a fine example of tone value and will reproduce well, but too many color drawings are sadly lacking in this very necessary requirement.

IDENTIFICATION

All renderings should be signed, monogrammed or initialed. For cataloging purposes, a title or at least a project number should accompany all drawings. If the title is to be included in the reproduction, it should be placed on the drawing, not on the mat. Both title and number are important as they serve to identify the work, thus preventing misclassification, which frequently leads to costly errors.

Cameragraph by Palmer Shannon

CARBON PENCIL SKETCH ON CAMEO PAPER BY CHESTER B. PRICE
DRAWING OF WALL STREET AND IRVING TRUST COMPANY BUILDING



Cameragraph by Palmer Shannon

WASH DRAWING BY LLOYD MORGAN
HOTEL WALDORF-ASTORIA, NEW YORK
SCHULTZE AND WEAVER, ARCHITECTS

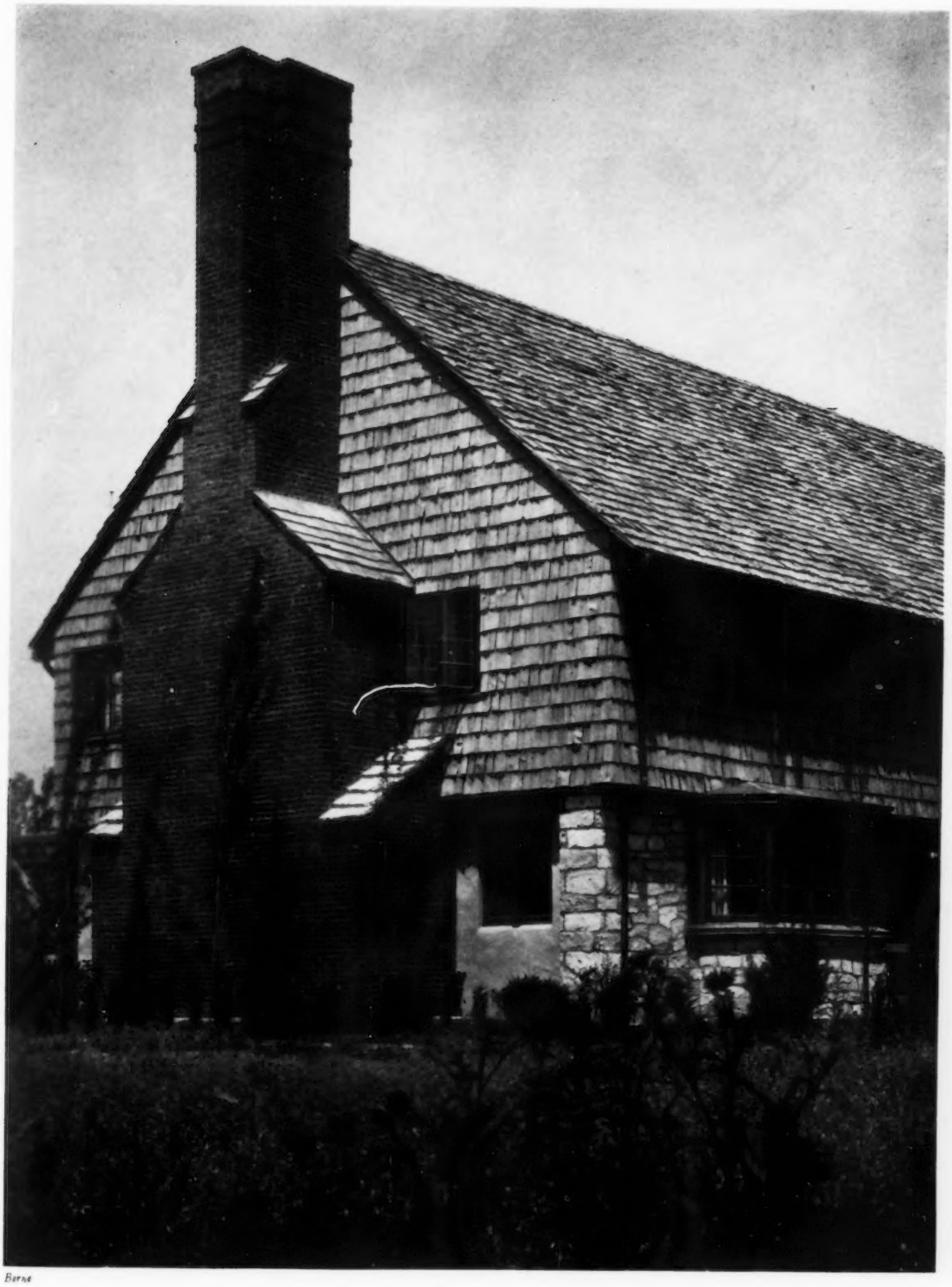
PORTFOLIO OF HOUSES

Gottscho

HOUSE OF FRANK C. ROOT
GREENWICH, CONNECTICUT
WILLIAM F. DOMINICK, ARCHITECT

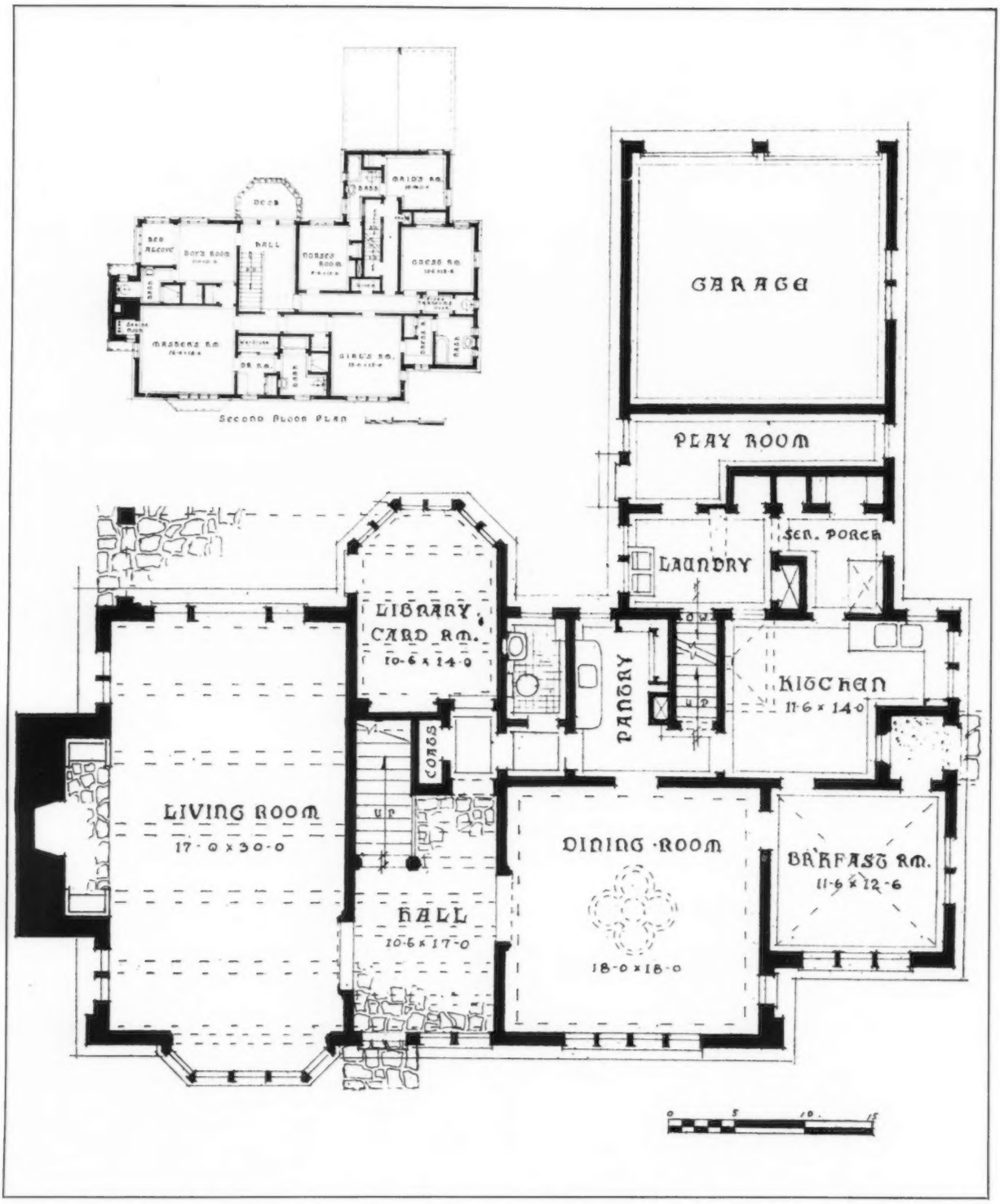
Nyholm and Lincoln

HOUSE OF MR. AND MRS. PAUL M. BOWEN
GROSSE POINTE, MICHIGAN
HENRY F. STANTON, ARCHITECT



Berne

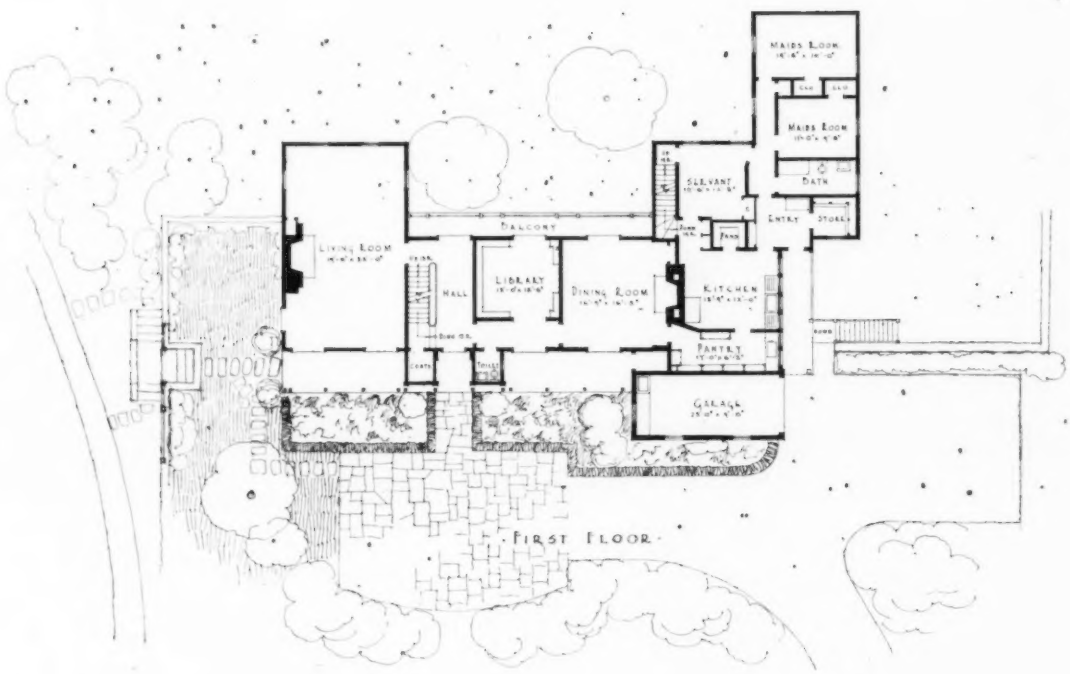
HOUSE OF CHESTER WURSTER
HOLLYWOOD, CALIFORNIA
NEWTON AND MURRAY, ARCHITECTS



HOUSE OF CHESTER WURSTER
HOLLYWOOD, CALIFORNIA
NEWTON AND MURRAY, ARCHITECTS

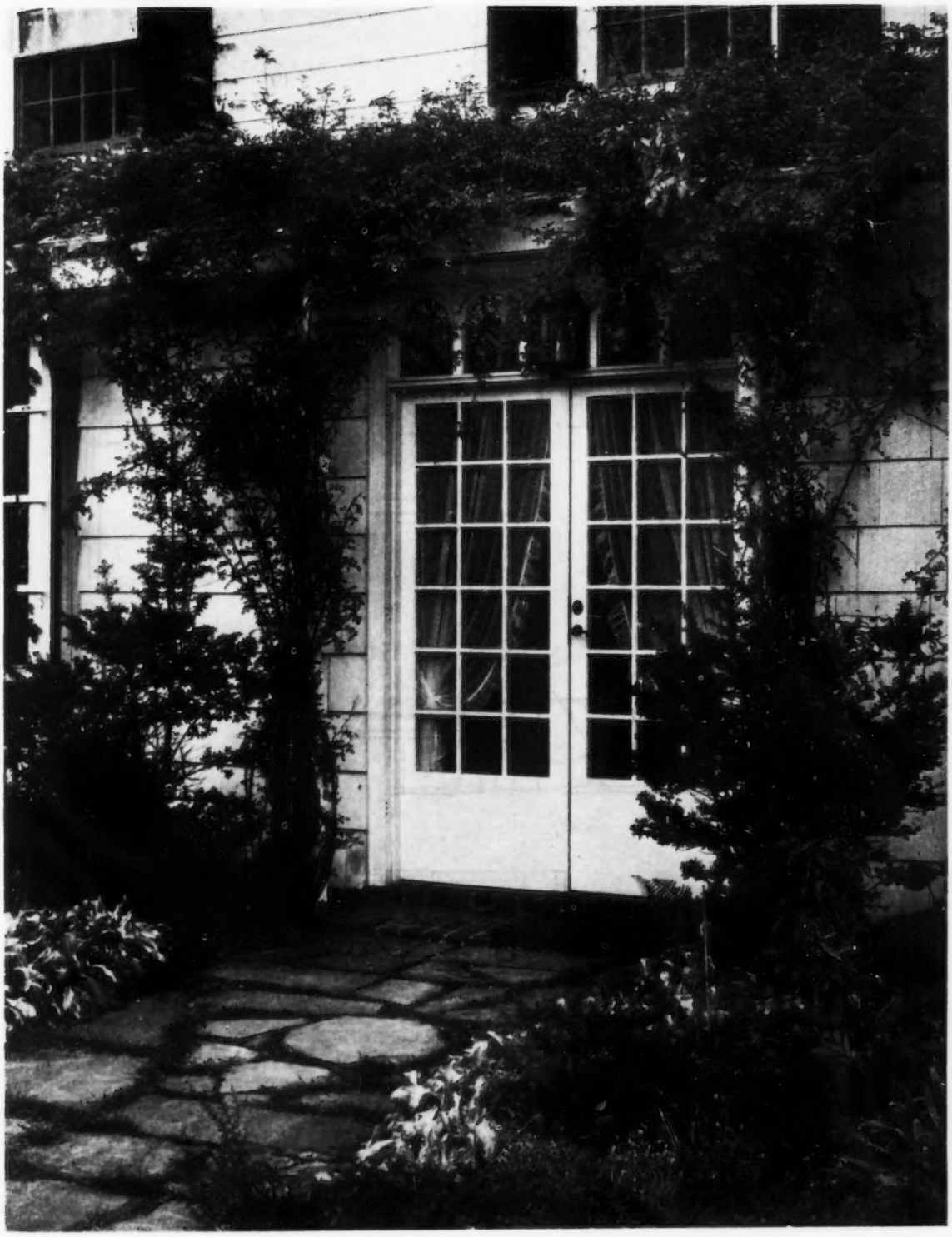
Van Anda

HOUSE OF GARDNER HAZEN
RYE, NEW YORK
CAMERON CLARK, ARCHITECT



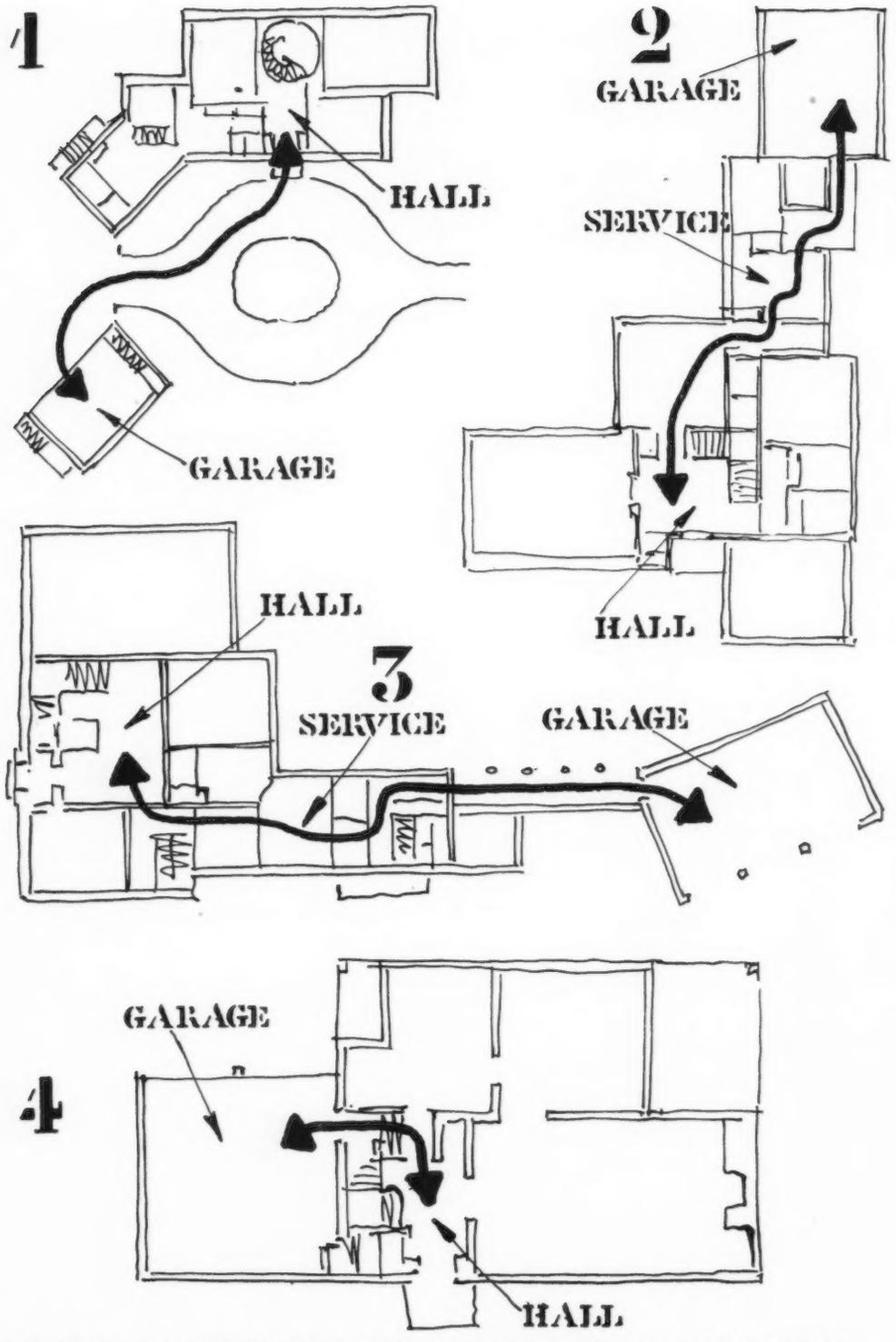
Van Anda

HOUSE OF GARDNER HAZEN
RYE, NEW YORK
CAMERON CLARK, ARCHITECT



Van Anda

HOUSE OF GARDNER HAZEN
RYE, NEW YORK
CAMERON CLARK, ARCHITECT



USUAL HOUSE PLANS SHOWING RELATION OF ENTRANCE HALL TO GARAGE

1. Garage separated from house. There is inconvenience in going outside to reach garage.
2. Garage incorporated in house plan. Undesirable passage from stairhall to garage through dining and service rooms.
3. Plan with same objections and additional separation by open-air cloister.
4. Most direct relation of hall and garage. This is a desirable arrangement since you can conveniently enter and leave house by motor car.

PLANNING THE HOUSE GARAGE

PURPOSE

The house garage should be considered as the entrance to the house.

It should be readily accessible from the stair hallway.

It should be reached as directly as possible from the street.

Storage space should be provided for one or more cars.

CUBIC AREA

The garage size is determined by automobile sizes and utilitarian uses to which the house garage is put.

*Dimensions of Motor Cars**

Length: 12′ 11¼″ (Ford A) to 18′ 8″ (Cadillac 353).
Width: 5′ 2″ (Essex D) to 6′ 0″ (Cord L29).
Height: 5′ 3″ (Ruxton) to 6′ 5″ (Lincoln).

Dimenions of House Garage

One-Car Garage

Inside Length: 17′ 0″ to 21′ 0″.
Inside Width: 9′ 0″ to 12′ 0″.
Inside Height: 7′ 4″ to 9′ 0″.

Two-Car Garage

Inside Length: 17′ 0″ to 21′ 0″.
Inside Width: 16′ 0″ to 18′ 0″.
Inside Height: 7′ 6″ to 9′ 0″.

Additional floor area may be required when provision is made for work space, coat room, storage and toilet facilities.

DOORS

Overhead and side sliding doors are preferred to doors that swing outward. The latter are objectionable because of their difficulty of operation when snow drifts against doorway and in windy locations. Overhead and side sliding doors require no space needed for car storage. The overhead type of door is necessary where curbs, as in illustration, are installed.

Door dimensions should be 8′ 0″ wide by 7′ 0″ in height.

*Full listing of Motor Car Dimensions for 1931 may be obtained from Automobile Chamber of Commerce, 366 Madison Avenue, N. Y. C.

CONSTRUCTION

Walls of garages should be built of concrete, hollow tile, brick or other approved incombustible material; or they should be built with 4-inch studs, filled solidly with brickwork laid in mortar or other incombustible material faced with metal lath and ¾″ cement plaster. Door from garage to house should be metal-covered on side toward garage, same to be of galvanized iron ranging from 18 to 26 gauge or 16 to 32 oz. copper, and same to be painted in color to contrast with wall.

Ceiling over garage shall be covered with metal lath and at least ¾″ coat of cement or gypsum plaster;* or by a ½″ layer of asbestos board covered with a ¼″ layer of plaster or with a layer of sheet metal.

Floors laid on the ground shall have a leveling fill of 6″ composed of crushed stone, cinders or gravel, well tamped and leveled to receive 4″ of concrete with a 1:2:4 mix (Portland cement, clean sharp sand and trap rock or gravel to pass a 1½-inch ring). Concrete floor to be finished with 1″ of cement mortar, consisting of one part cement and two parts sand, and troweled to an even, dense surface. The concrete base and surface to pitch to drain with 1 inch fall to every six feet.

MECHANICAL EQUIPMENT

Heating: hot water or steam with line run from house boiler. Radiation should be computed so as to provide 60° temperature with thermostatic control to operate drafts of furnace should the temperature drop below 35°. Both electric and coal burning heaters are available for the detached garage.

Ventilation: provide louvered metal ventilators on side of wall of garage, 2′ 0″ above floor level. Louvers of vent should be opened automatically when garage is entered.

OTHER ELEMENTS

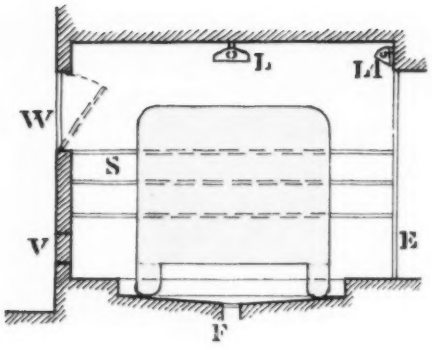
Drain: a heavy service cast iron drain with brass strainer of approved make should be installed in concrete floor connected to sewer system.

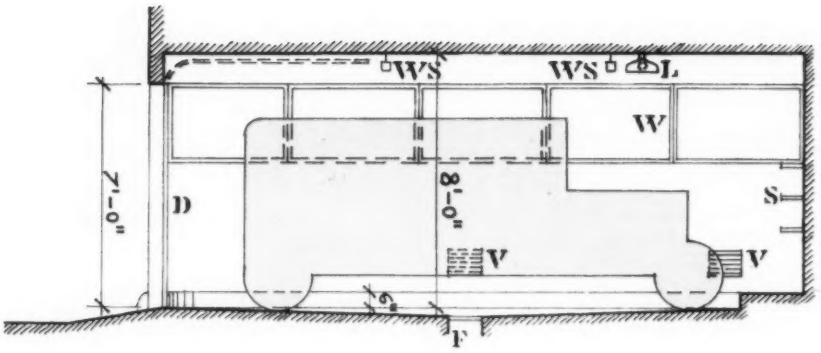
Water: spigot placed convenient to head of car fitted with sufficient length of linen hose.

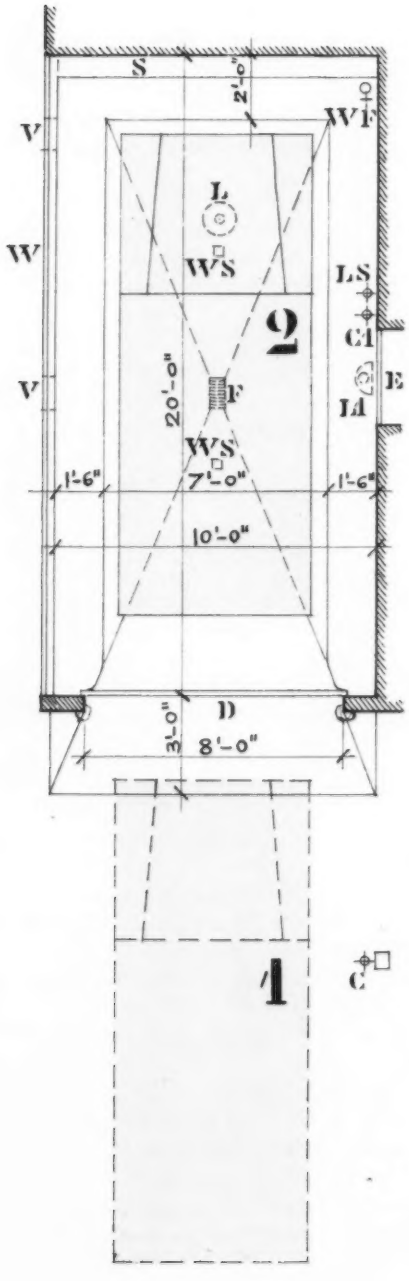
Shelves: for storage of tools, grease gun, oil and cleaning equipment.

Color: walls painted millwhite to reflect light. Face of curb at entrance in black and white diagonal stripes. Inside entrance door to house to be painted black or gray.

*Cement plaster is preferred, both as a fire-resistant and as protection against corrosion when metal lath is used.







TYPICAL GARAGE LAYOUT
(1 car)

Key to Indication on Plan and Sections

1 Car shown on plan before entering garage in position to operate control switch C.

2 Car inside garage.

C Control switch operated by driver to open, close and lock garage doors without leaving car.

C 1 Control switch for same purpose inside garage.

D Garage doors (overhead)

E Entrance door to house (metal clad).

F Floor drain at center of garage.

L Ceiling reflector over engine.

L 1 Light at house entrance, directed on running board.

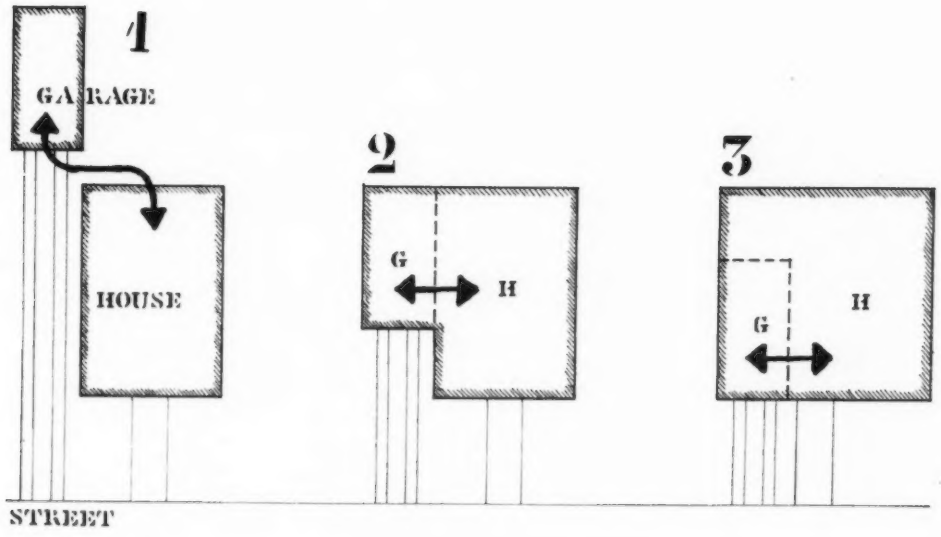
L s Light switches.

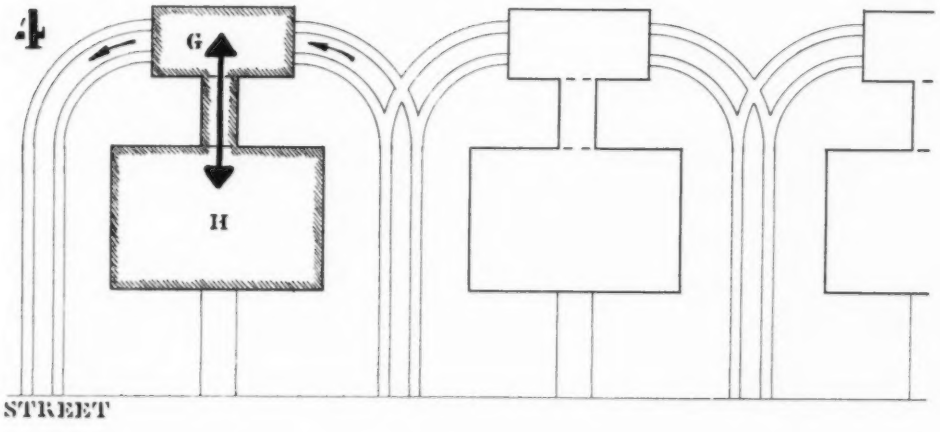
S Shelving for storage of supplies.

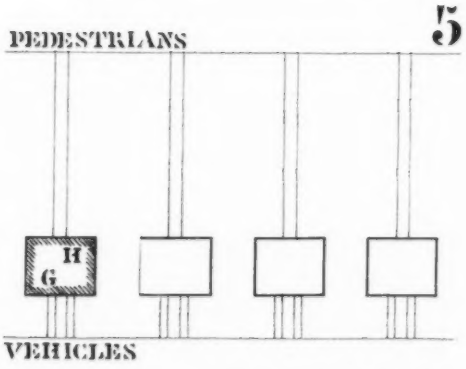
V Vents near base of wall.

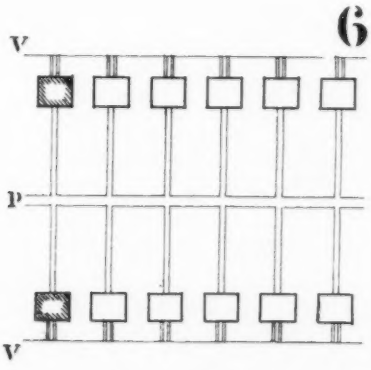
W Windows hinged at bottom.

W s Sprinkler system for fire protection.









1. Detached garage, an arrangement suggested by the stable which was separated from house for sanitary reasons.
2. Same garage unit attached to house in order to attain convenience of entry. There is no valid reason as in case of stable to separate the two elements.
3. Final step in evolution. The garage is here incorporated in house plan and is most directly accessible from entrance hallway and from street.
4. An arrangement with garage at rear making available entire house frontage for living rooms. Cars may drive into and out of garage instead of backing out to street. One driveway serves two garages.

5, 6. A desirable separation of pedestrians and vehicles with grouped houses. Garage entrances face highways. Hall entries for pedestrians and the living rooms front gardens.

Washroom: adjacent to entrance of house from garage. Equipment: toilet seat, wash basin, mirror, paper towel rack, waste towel holder, soap container, closet for clothes storage, and hangers.

Apron to be of concrete (see construction of floors), same to extend 1 foot at each side beyond the door opening.

Lighting: ceiling light near end of garage over front end of motor car, equipped with dome type reflector so as to thoroughly illuminate engine (60-watt lamp). Wall light at entrance to garage from house for single car garage, with angle reflector to direct light on running board. Control of lights should be from house entrance hall and at main door entrance.

Power connection at wall over work bench or adjacent to entrance door from house (see plans).

Windows at side of garage afford better lighting of garage interior than glazed doors because daylight from side windows illuminates the length of car rather than the rear. Windows should be placed near to ceiling and should extend the entire garage length. They should be hinged at bottom to open in.

Overhead car washer to be installed on ceiling at place determined by location of cars; the washer to be equipped with an automatic cut-off so as to permit the regulation of the water supply. (Some models are made with an electric light attachment for the hose arm, and with special clamps, socket and reflector.)

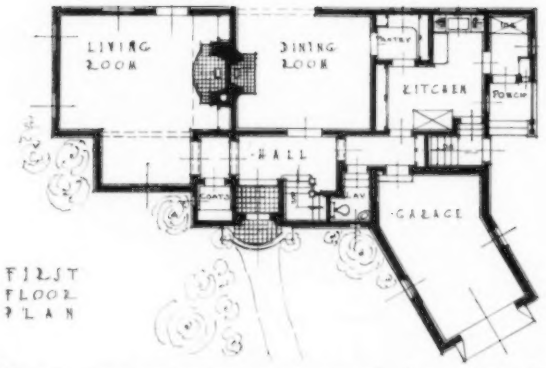
Door Opening Devices:

1. The General Power Door Unit, operated by electricity, opens, closes and locks the garage doors (General Power Door Company, St. Cloud, Minn.). It can be installed on almost any kind of garage door. The usual installation carries a three-station control system—a push button within the garage, one within the house and one at the key-lock switch outside the garage.

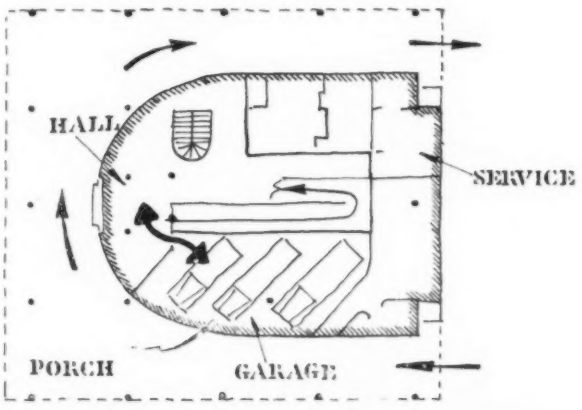
2. With radio control (Barber-Coleman Company, Rockford, Ill.), the driver of a car about to enter the garage can open doors and light the garage lights by simply pulling a knob on the instrument board. For full details see ARCHITECTURAL RECORD, December, 1930, p. 480.

Sprinklers: provide an approved automatic sprinkler system so constructed as to protect every square foot of floor area. Each sprinkler head to protect not in excess of 100 square feet area.

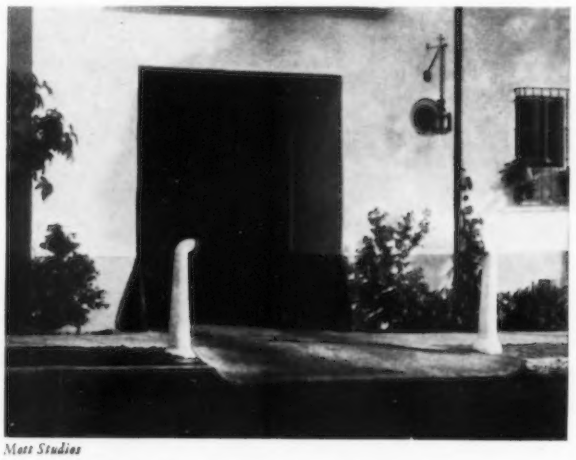
A. LAWRENCE KOCHER
AND ALBERT FREY



Direct communication with garage from hall. The lavatory and coat room are convenient for entrance from garage and at front door entrance to house.
MERTON E. GRANGER, ARCHITECT

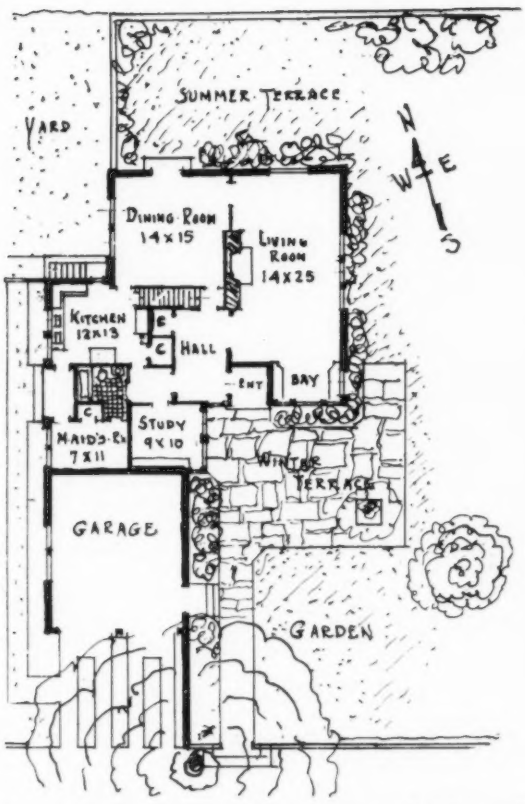


An arrangement of garage, hall and service on ground level. There is a continuous drive around these enclosed rooms. The upper floors with living rooms form a shelter over the drive and entrances.
LE CORBUSIER AND P. JEANNERET, ARCHITECTS



Mott Studios

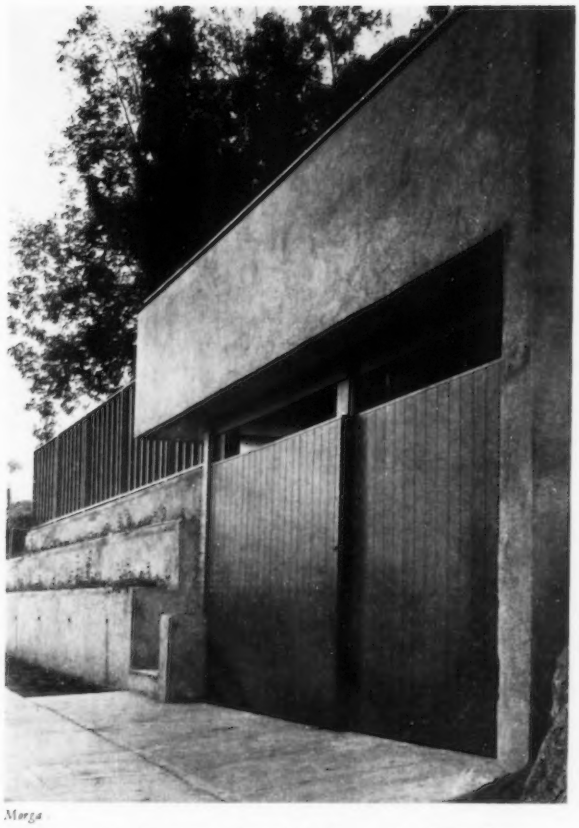
Garage with door opening units (posts with key-lock switch) electrically opening, closing and locking garage doors without leaving car.
ARTHUR B. ZWEBELL, DESIGNER



Garage entrance screened from front garden by wall. Entrance to house from garage is by unsheltered path.

R. C. WEINBERG, ARCHITECT

Gillies



Morga

Garage at driveway level below the first floor, a solution imposed by the steep slope of site. An exposed stairway parallels the garage to upper level.

STUDIO OF CONRAD BUFF, LOS ANGELES
RICHARD J. NEUTRA, ARCHITECT

Gillies

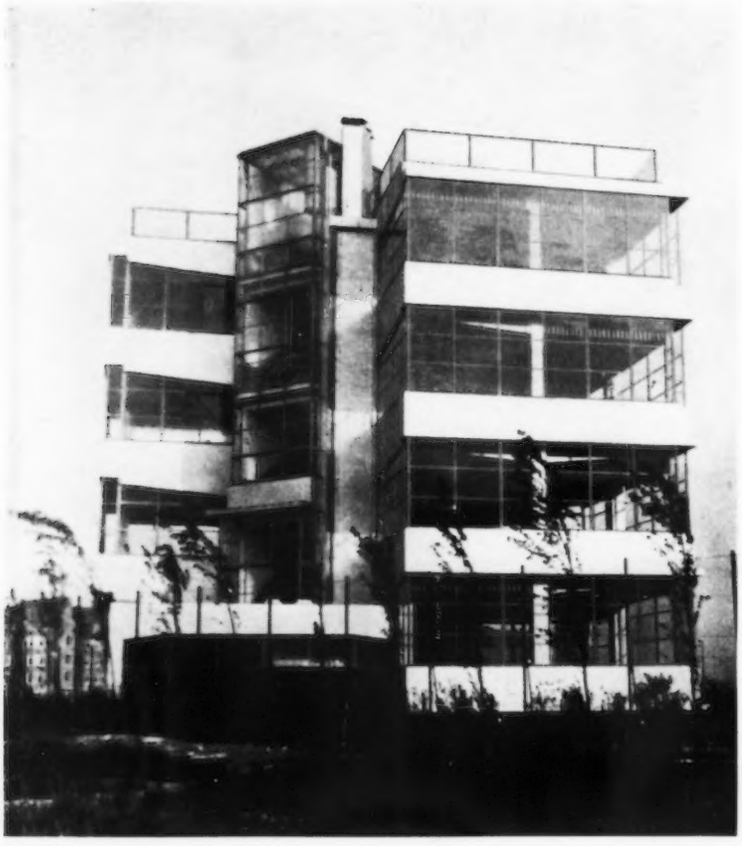
Garage attached to house at lower level.

HOUSE OF HARRY LOGAN, WARREN, PA.
FRANK J. FORSTER, ARCHITECT

Garage near street for house on small site with slope to rear. Stairways for service and to main house are at limits of property.

HOUSE OF EDWARD C. DUBEL, FOREST HILLS, L. I.
FRANK J. FORSTER, ARCHITECT

AN OPEN-AIR SCHOOL IN HOLLAND



Windows, which can be opened or closed according to the weather, form the three outside walls of each classroom in this new school in Amsterdam. Open roofed balconies are attached to the outer walls. The fourth and inner wall of each classroom faces a stairway, and has built-in shelves and washstand and movable blackboards.

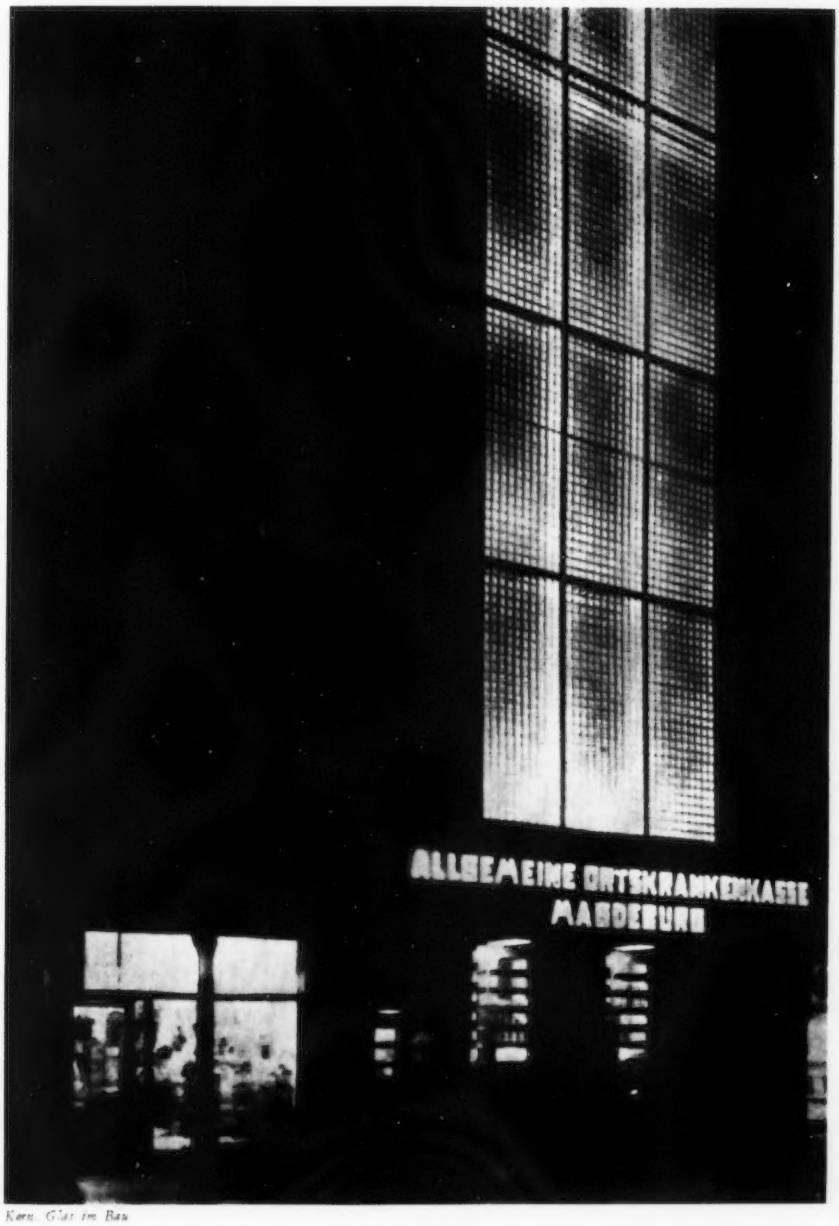
Below the roof is a central heating system. A system of pipes warms floors and ceilings. There are no heating tubes exposed in the classrooms.

On the ground floor is a gymnasium, also enclosed by glass walls.

The school was built not for children suffering from sickness but for normal healthy children between the ages of six and twelve.

Photographs by
M. L. JORGENSON

LUXFER GLASS PRISM CONSTRUCTIONS*



Kunst. Glas im Bau

BANK IN MAGDEBURG. WORM AND KRAYL, ARCHITECTS

THE GLASS UNITS

Pressed glass tiles in sizes from 10 to 17 cm. with prismatic, diamond or modeled surfaces designed for diffusion and controlled refraction of exterior light or for diffused reflection of interior light to avoid the usual black appearance of flat glass at night. The tiles are made of clear, reinforced or colored glass of high strength and great heat resistance.

* The German *Luxfer* glass constructions are based on designs by the American architect, F. L. Keppler, president of *Relief Glass Construction*, New York, and former owner and present American representative for *Deutsche Luxfer Prismen Gesellschaft*.

FIG. 1
CURVED LUXFER ROOF CONSTRUCTION FOR OIL REFINERY BEFORE AND AFTER A FIRE. THE TILES BROKE IN THE INTENSE HEAT FROM THE BURNING OIL BUT DID NOT FALL OUT OF THE FRAMES.

GLASS CONCRETE CONSTRUCTIONS

Glass units embedded in slender ribs of reinforced concrete. The glass is an integral part of the construction.

ROOF CONSTRUCTION

Figs. 1, 2, 3

Precast panels or field construction with metal forms. Broken or damaged glass units are exchanged easily without injuring the supporting framework. Condensation is greatly reduced. High bearing capacity. Used for roofs and interior floors. Special tiles for roof construction are provided with an edge groove in which bitumen plaster of about 5 mm. thickness is laid sealing the vertical joints between the glass and the concrete and haircracks in the concrete to prevent corrosion of the reinforcing.

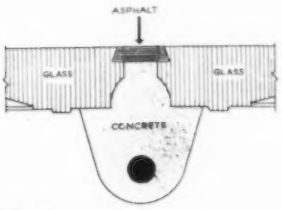


FIG. 2
LUXFER ROOF CONSTRUCTION SHOWING INSULATION OF JOINTS.

WALL CONSTRUCTION

Figs. 4, 5

Tiles consisting of two superimposed parts sealed together, forming a cavity for air. Broken units are easily exchanged without damaging the other part of the tile or of the adjoining units. The flanges of the tiles are designed to refract the light, which is stopped by the muntins in the usual window constructions. The single parts of the tiles can expand independently of each other, eliminating internal stresses when exposed to fire. The exterior smooth surfaces are cleaned easily. Low maintenance cost. Used for exterior and interior walls and partitions. Maximum size of panels 35 to 40 square feet. Precast in shop or built in field. Cost about $4 per square foot.

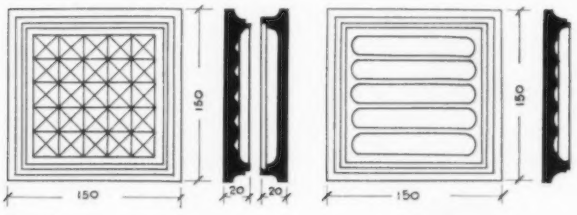


FIG. 4
TILES FOR LUXFER WALL CONSTRUCTION. DIMENSIONS IN MILLIMETERS.

FIG. 3
LUXFER ROOF CONSTRUCTION FOR BANK IN MAGDEBURG. WORM AND KRAYL, ARCHITECTS

FIG. 5
LUXFER WALL CONSTRUCTION FOR HOSPITAL IN POTSDAM. MOHR, ARCHITECT

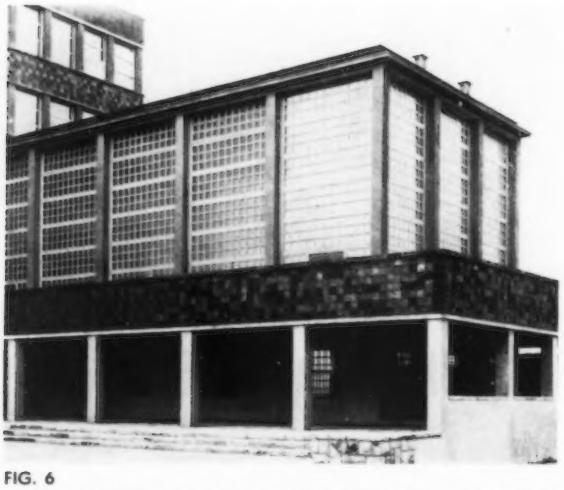


FIG. 6
LUXFER CONCRETE FRAME WINDOWS. RESEARCH LABORATORY, DORTMUND.

FIG. 7
LUXFER CONCRETE FRAME WINDOWS. AIRPORT IN HAMBURG. DYRSSEN AND AVERHOFF, ARCHITECTS.

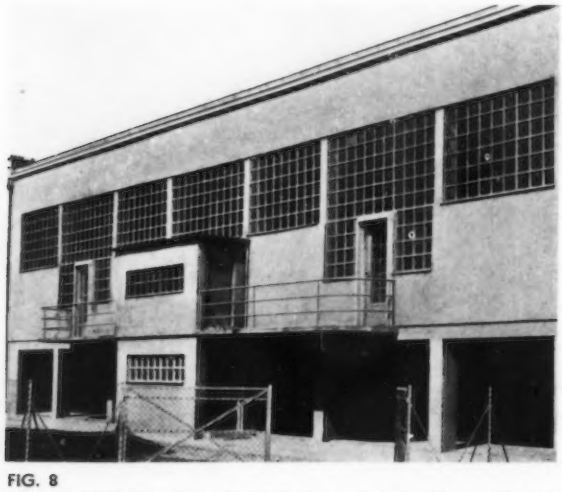


FIG. 8
LUXFER CONCRETE FRAME WINDOWS. TRANSFORMER STATION, PFALZ.

ELECTROLYTICALLY FRAMED TILES

The tiles can be fastened electrolytically in copper muntins. The glass units are placed in a network of copper strips in an electrolytical bath. By this process the tiles are sealed tightly by the metal. The overall width of the finished muntin is about $^1/_8$ inch. The panels are made in sizes up to 16 square feet and are then fastened in metal frames with loose joints allowing for expansion in case of fire. This construction is used for walls, ceilings, roofs, store fronts and lighting fixtures. On account of its high fire-resistant property it has been used for fire curtains in department stores.

CONCRETE FRAME WINDOW UNITS

Figs. 6, 7, 8, 9

Machine-made concrete frames of standardized dimensions placed together and joined with cement mortar. Openings over 40 square feet are reinforced with rods embedded in the joints. The frames can be made for single or double glazing with ordinary sheet glass or for prismatic or diamond *Luxfer* glass tiles. Special putty is used for the glazing. Metal ventilators can be placed in the frames where desired. The construction requires no painting. The panels are fireproof and of low heat transmission compared with steel sash. The construction can be erected with unskilled labor. The maintenance cost is low.

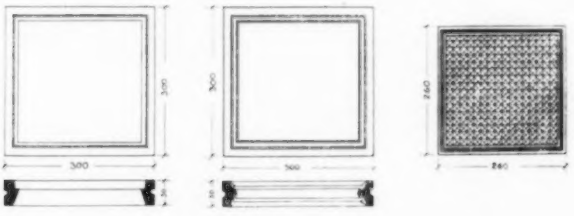


FIG. 9
LUXFER CONCRETE FRAME WINDOWS FOR SINGLE AND DOUBLE GLAZING AND FOR LUXFER TILES. DIMENSIONS IN MILLIMETER.

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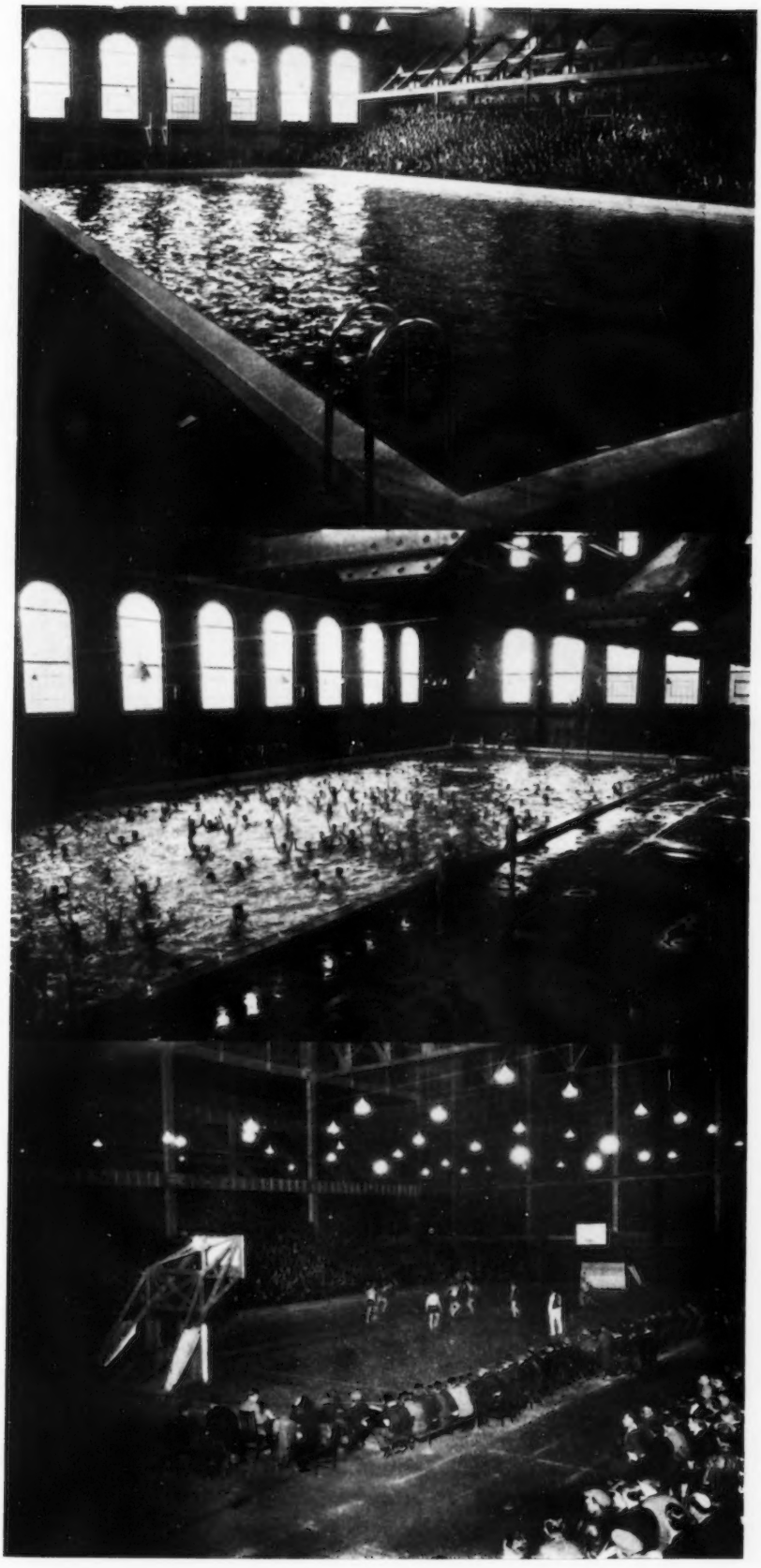
Glas in der Architectur der Gegenwart, by K. W. Schulze, Wissenschaftlicher Verlag Dr. Zaugg & Co., Stuttgart, 1929.

Glas im Bau und als Gebrauchsgegenstand, by Arthur Korn, Ernst Pollak Verlag, Berlin-Charlottenburg.

Physical Properties of Glass, THE ARCHITECTURAL RECORD, October, 1930.

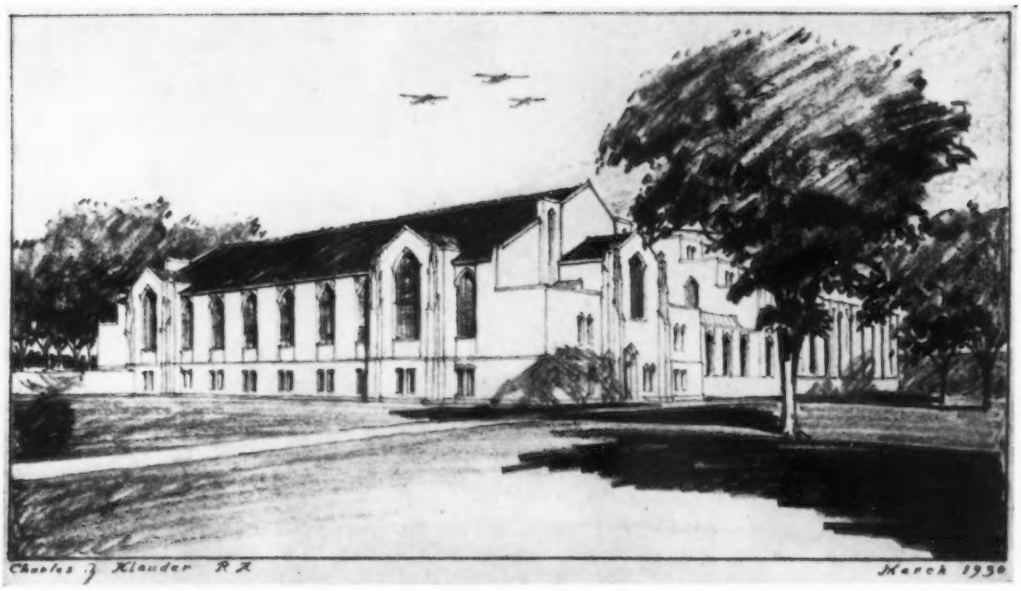


GYMNASIUM AND FIELD HOUSE
IOWA STATE UNIVERSITY
PROUDFOOT, RAWSON, SOUERS
AND THOMAS, ARCHITECTS

TECHNICAL NEWS
AND RESEARCH

GYMNASIUM PLANNING

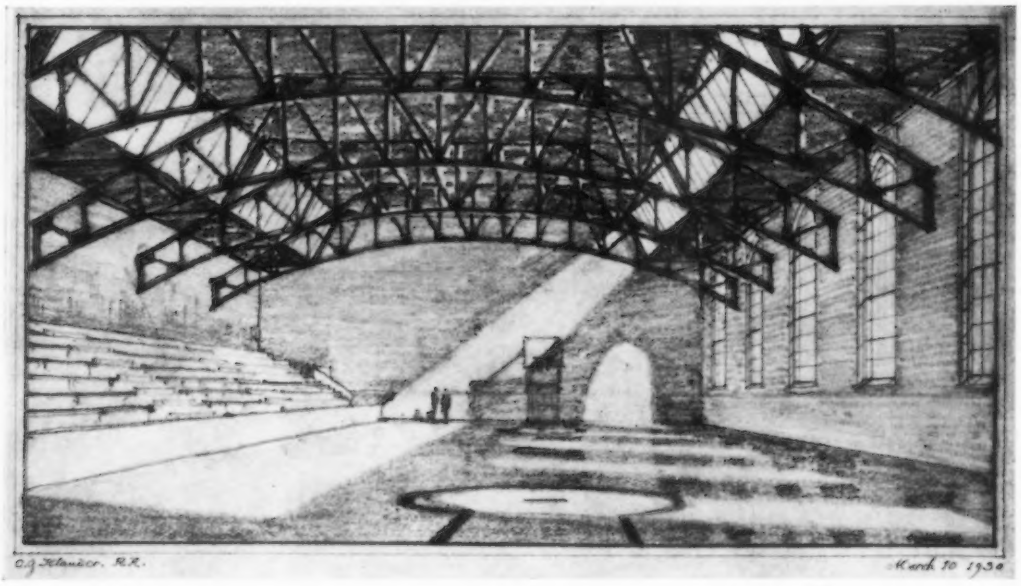
By
ROBERT L. DAVISON



Exterior of gymnasium building.

See plans on page 86.

BASEBALL CAGE SWIMMING POOL GAME ROOM



Basketball room.

THE HILL SCHOOL
POTTSTOWN, PENNSYLVANIA
CHARLES Z. KLAUDER, ARCHITECT

GYMNASIUM PLANNING*

The design of a gymnasium involves first of all a clear definition of its functions, which in time must be translated into an equally definite statement of physical requirements.

A questionnaire in the form of a table should be prepared by the architect and submitted to the athletic or physical education department or building committee with the request that it be used as a checklist to aid them in expressing an opinion as to what facilities the structure should contain, physical requirements to be met, the number of persons who would use these different facilities, and so forth. The accompanying questionnaire, prepared by Frederick L. Ackerman as an aid in the preparation of the plan for the Cornell gymnasium, gives a good idea of what a questionnaire for a college gymnasium building should cover. The same method can be modified to meet other types of gymnasium buildings.

The facilities to be included must not only be such as to serve future needs, but must also, except in rare instances, be so chosen that a structure of minimum or mean volume will provide facilities for something like a maximum number. To illustrate: some indoor games and activities require about twenty-five times as much volume per man as others, so that the typical problem in its broad outlines is obviously that of providing, within a reasonable volume of structure, for such diversified activities as will engage the interest of the maximum number of students.

"In the selection of facilities we must be guided, to some extent, by local habits. But there are certain general considerations that obtain in any case. Some students will respond only to the prospect of participating in intramural or intercollegiate athletics; others will be interested only in games and casual play; still others will engage in physical exercise only under organized guidance and in calisthenics, and the like, so that diversity with respect to facilities is not merely diversity with respect to games; it is *diversity with respect to types of activities*—calisthenics, organized recreation, casual play." (1)**

*We wish to acknowledge the kind assistance of the following:
Mr. Frederick L. Ackerman, architect.
Dr. N. L. Engelhardt, Teachers' College, Columbia University.
Thomas, Martin and Kirkpatrick, architects.
Mr. Arthur Winters, Department of Physical Education, Hamilton College, New York.
Mr. R. L. Rayburn, Assistant Director of the Architectural Bureau of the Y. M. C. A.
Miss Lena Farrar, City Secretary of the National Board of the Y. W. C. A.

**See references on page 90.

DESIRABLE GYMNASIUM FACILITIES

The accompanying list of facilities, in order of rating, as prepared by the Committee on Construction and Material Equipment of the Society of Directors of Physical Education in Colleges, will also aid the architect in preparation of a questionnaire or checklist for submittal to his building committee.

GYMNASIUM CHECKING LIST

Listed in order of importance. (From report of Committee on Construction and Material Equipment, 1).

I. MAIN FLOOR
1. Basketball court
2. Physical education class floor
3. Bleacher space†
4. Visitors' gallery
5. Running track
6. Dance floor
7. Banquet facilities
8. Stage

The tendency among the above units is toward less consideration for use of the floor for dancing, banquets and stage facilities.

II. SWIMMING POOL
1. Pool proper
2. Heating unit
3. Filtration plant
4. Diving equipment
5. Bleacher space
6. Visitors' gallery

III. LOCKER ROOMS
1. Main (general)
2. Home team
3. Visiting team
4. Officials
5. Corrective, faculty

Contrary to the above table the tendency in the larger institutions is to rate the corrective locker room above the officials' locker room.

IV. SHOWERS
1. Main (general)
2. Team room
3. Staff
4. Faculty
5. Officials

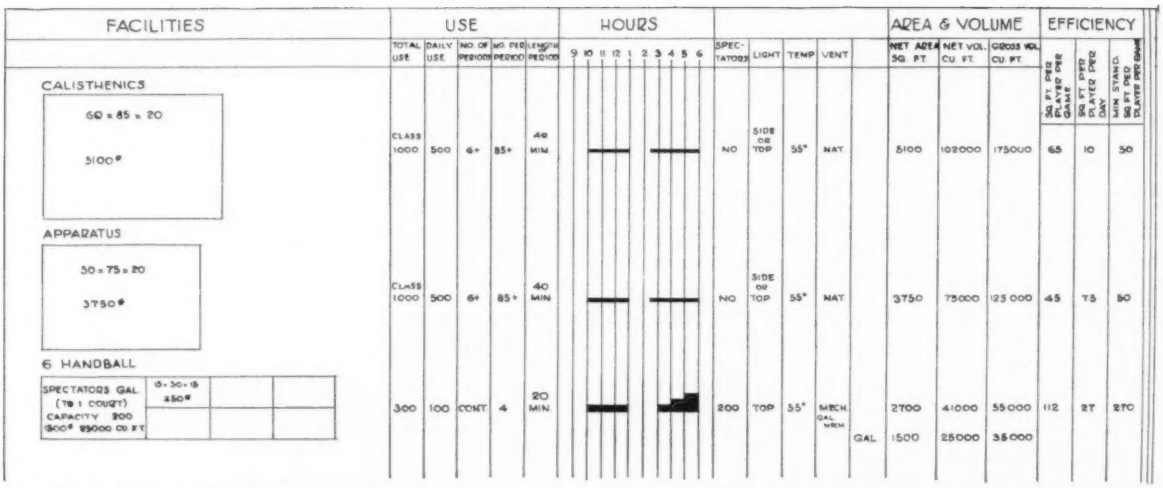
Of the auxiliary shower units those for the team room and staff are the most desirable.

†The recent survey conducted by Arthur R. Winters, Dept. of Physical Education of Hamilton College, shows that bleacher space is ranked ahead of physical education needs on gymnasium floor.

DIAGRAMMATIC PROGRAM SHOWING SIZE, USE, AND MAINTENANCE OF GYMNASIUM FACILITIES *

FACILITIES	USE					HOURS		AREA AND				VOLUME			EFFICIENCY		
	Total Use	Daily Use	No. of Periods	No. per Period	Length of Period	A. M.	P. M.	Spectators	Light	Temperature	Ventilation	Net Area Sq. Ft.	Net Volume Cu. Ft.	Gross Volume Cu. Ft.	Sq. ft. per player per game	Sq. ft. per player per day	Min. Standard sq. ft. per player per game
Calisthenics 60x85x20 5100 sq. ft.	Class 1000	500	6+	85+	40 Min.	10-1	2:30-6	No	Side or Top	55°	Nat.	5100	102000	175000	60	10	50
Apparatus 50x75x20 3750 sq. ft.	Class 1000	500	6+	85+	40 Min.	10-1	2:30-6	No	Side or Top	55°	Nat.	3750	75000	125000	45	7.5	50
Rowing Machines 50x60x20 3000 sq. ft.	Class 500	400	Cont.	38			2-6	No	Side or Top	55°	Nat.	3000	60000	85000	80	7.5	80
Rowing Tank 50x60x20 3000 sq. ft.	Class 200	100	Cont.				2-6	No	Side or Top	55°	Nat.	3000	60000	100000		30	
Two Volley Ball Courts 30x50x20 1500 sq. ft.	Game 200	100	Cont.	20	45 Min.		4-6 3-6	No	Top			3000	60000	85000	75	30	75
Five Basketball Courts 45x75x22 3375 sq. ft.	Game 1000	500	Cont.	10	1 Hr.	10-1	5-6 4-6 2:30-6	500	Top	55°	Nat. and Mech.	16875	370000	530000	337	34	3000
One Basketball Spectator Gallery, 500 Cap. 3500 sq. ft. 70,000 cu. ft.												Gal.	3570	70000	100000			
Six Handball Courts 30x40x20 1200 sq. ft.	Game 300	100	Cont.	4	30 Min.	10-1	5-6 4-6 3-6	200	Top	55°	Nat. and Mech.	7200	144000	190000	300	72	300
Six Handball Courts 15x30x15 450 sq. ft.	300	100	Cont.	4	20 Min.	10-1	5-6 4-6 3-6	200	Top	55°	Mech.	2700	41000	55000	112	27	270
One Handball Court Spectator Gallery, 200 Capacity, 1500 sq. ft., 25000 cu. ft.												Gal.	1500	25000	35000			
Pole Vaulting, Jumping, etc. 3 strips 12x120x20 4300 sq. ft. 3 strips, 12x45x20, 1620 sq. ft.	200	100	Cont.	14		10-1	5-6 4-6 3-6	No	Side or Top	55°	Nat.	5940	119000	150000 (—)	400	59	400
Tennis, Indoor Soccer, Hockey 50x120x25 1620 sq. ft.	200	40	Cont.			10-1	5-6 4-6 3-6	500	Top	55°	Nat.	6000	150000	225000		150	Tennis 1800 Hockey 1000
One Tennis Spectator Gallery, 500 capacity 3500 sq. ft., 90000 cu. ft.												Gal.	3500	90000	110000			
Fencing 40x45x15, 1800 sq. ft.	100	50	Cont.	10		10-1	5-6 4-6 3-6	No	Side or Top	55°	Nat.	1800	27000	40000	180	36	200
Wrestling 40x60x20, 2400 sq. ft.	250	100	Cont.	12			4-6 3-6 2-6	No	Side or Top	55°	Nat.	2400	48000	60000 (—)	200	24	200
Boxing 40x50x15 2000 sq. ft.	250	100	Cont.	10			5-6 4-6 3-6 2-6	No	Side Side Top	55°	Nat.	2000	30000	45000	200	20	200
Swimming Pool 35x75 5500 sq. ft.	3000	300	Cont.			12-1	4-5 3-5 2-5	1500	Top and Side	72° to 75°	Mech.	5500	200000	300000		18	
Swimming Pool Spectator Gallery. Cap. 1500 10500 sq. ft. 260000 cu. ft.												Gal.	10500	260000	300000			
Swimming Pool 15x75 3000 sq. ft.	1000	200	Cont.				2-5	No	Side or Top	72° to 75°	Mech.		3000	90000	120000		15	
Corrective Gymnasium 30x40x20 1200 sq. ft.	300	150	Cont.	25					Side or Top	60° to 65°	Nat.		1200	24000	32000			
Indoor Golf 20x20x15 400 sq. ft.	100	25	Cont.	2					Side or Top	60° to 65°	Nat.		400	6000	8000			
Lecture Room 35x40x15 1400 sq. ft.	200								Side or Top	68°	Mech.		1400	21000	30000			
Medical Examination Room 60x260x15 15600 sq. ft.									Side and Top				15000	234000	300000			
Faculty Gymnasium 45x75x20 3375 sq. ft.									Side or Top	55°	Nat.		3375	68000	90000			
Three Thousand Lockers 160x100 16000 sq. ft.									Side or Top	65°	Mech.		16000	200000	275000			
200 Faculty Lockers 28x50 1400 sq. ft.									Side or Top	65°	Mech.		1400	17000	22000			
Sixty Showers 40x50 2000 sq. ft.										72° to 75°	Mech.		2000	35000	45000			
Ten-Lap Outdoor Track (8 to 10) Approx. 100x225. 10-12 ft. wide																	
Indoor Track 12 to 16 laps 6 to 9 ft. wide										68°					100000		
Toilets																	

* From Research Quarterly, 1930, The Society of Directors of Physical Education in Colleges.



TABULATION OF REQUIREMENTS OF VARIOUS ATHLETIC ACTIVITIES AS BASIS FOR GYMNASIUM DESIGN.
Prepared by Frederick L. Ackerman, architect, for Cornell University Gymnasium.
(See pages 68, 70 and 71 for plans and elevation.)

V. **GENERAL**

1. Office
2. Physical examination room
3. Lecture room
4. Ladies' room
5. Conference room
6. Reception room
7. Trophy room
8. Library

There is a distinct tendency to favor the first four units above the latter four.

VI. **SEPARATE EXERCISE AND ACTIVITY UNITS**

1. Handball courts
2. Corrective exercise room
3. Wrestling room
4. Small gymnasium
5. Boxing room
6. Baseball cage
7. Squash courts
8. Fencing room
9. Faculty gymnasium

Recommendations for the future show an appreciable gain in the desirability of squash, fencing, and small gymnasium facilities, and in that order. Indoor cage facilities were the only units to show a decrease in relative value.

VII. **SUPPLEMENTARY ROOMS**

1. Stock room
2. Trainer's room
3. Janitor's room
4. Bleacher storage
5. Drying room
6. Apparatus storage
7. Machine and repair room
8. Laundry

There is no indication of change in the order of desirability of these units.

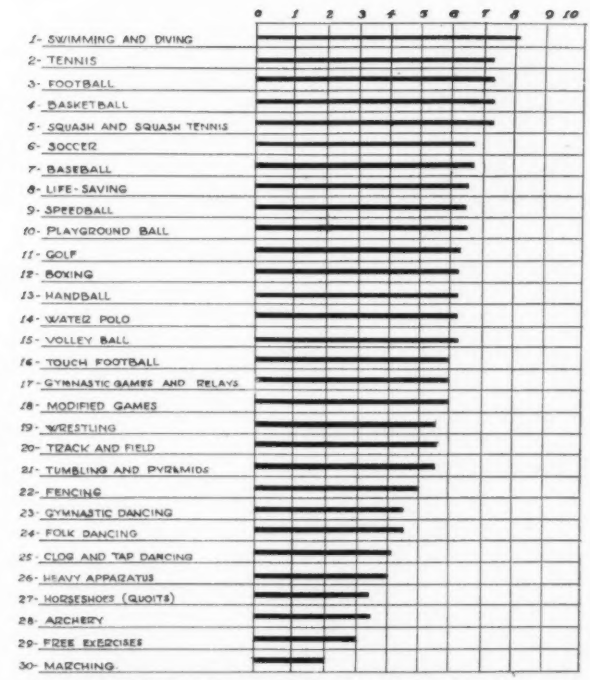


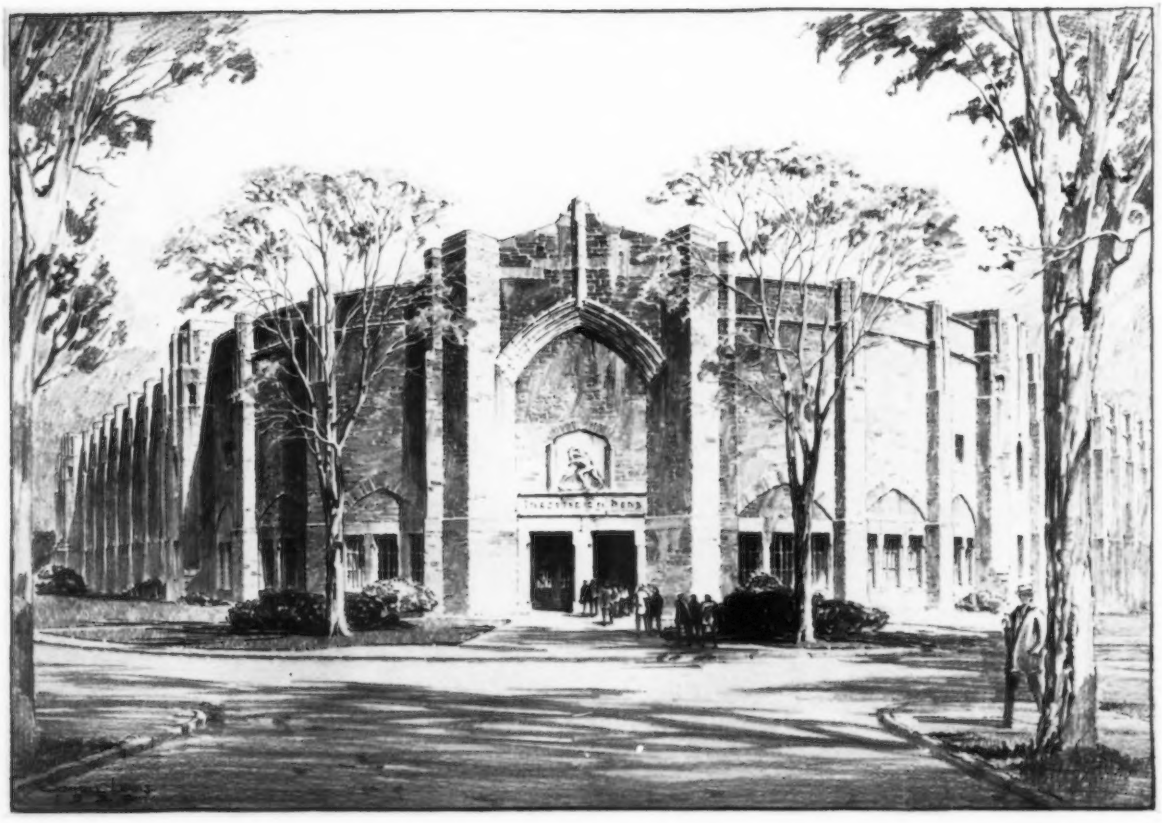
CHART SHOWING THE RELATIVE "ALL-ROUND" VALUE OF VARIOUS SPORTS. (11)

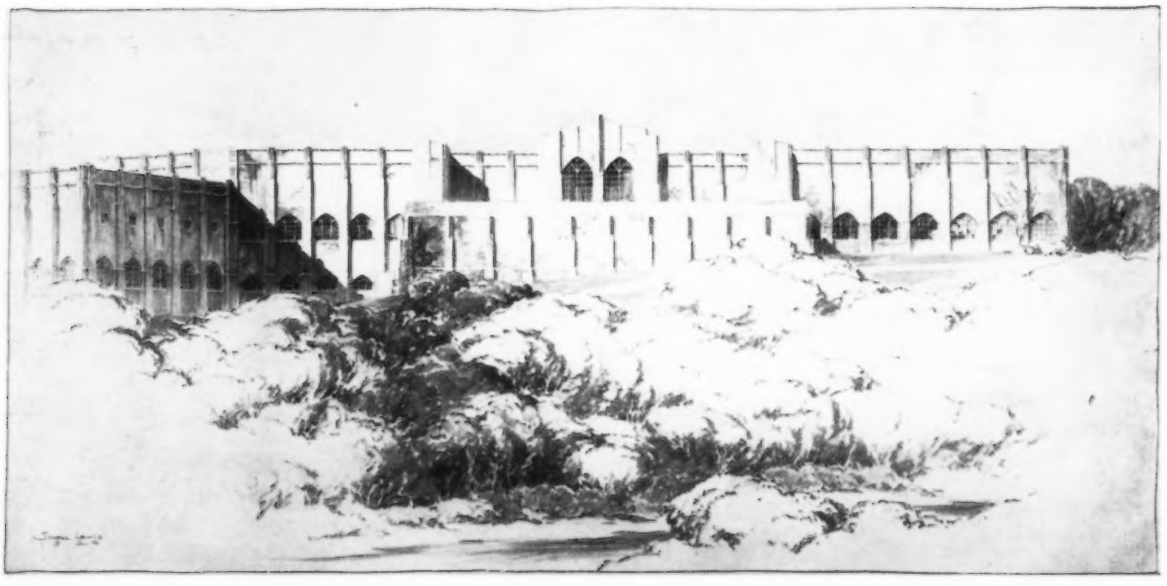
SPECIFIC REQUIREMENTS DETERMINED BY QUESTIONNAIRE

After having obtained a tabular statement of the wishes of the athletic authorities or building committee, the architect will find the design problems simplified if he will analyze such requirements as will condition definitely the arrangement of the plan.

Dual purpose limits gymnasium design

Where a gymnasium has to serve several functions, such as use for an assembly hall or stage, etc., these





PROPOSED GYMNASIUM
CORNELL UNIVERSITY, ITHACA, NEW YORK
FREDERICK L. ACKERMAN, ARCHITECT

See "Tabulation of Requirements of Various Athletic Activities," pages 66 and 67.

functions will outweigh frequently some of the requirements of the physical education program. When compromise is required, it will be advisable for the architect and building committee to weigh from the assembled data at an early period the relative importance of the various functions to be demanded of the combined gymnasium and to decide on the particular form of compromise to be adopted.

The gymnasium and auditorium may be combined in one of two ways:

(1) The stage floor may be made of ample width and depth so as to allow its use either as an ordinary stage or closed off from the auditorium and used as a gymnasium.

(2) The auditorium floor when cleared of collapsible chairs may be utilized as the gymnasium floor. In this case, a small stage is placed at one end or side of the auditorium.

Although a few years ago this dual use was accepted as the ultimate in gymnasium planning for schools, it is not generally advisable to plan for dual use because of the desirability of using both gymnasium and auditorium for a large part of the school day.

Natural light requirements limit height

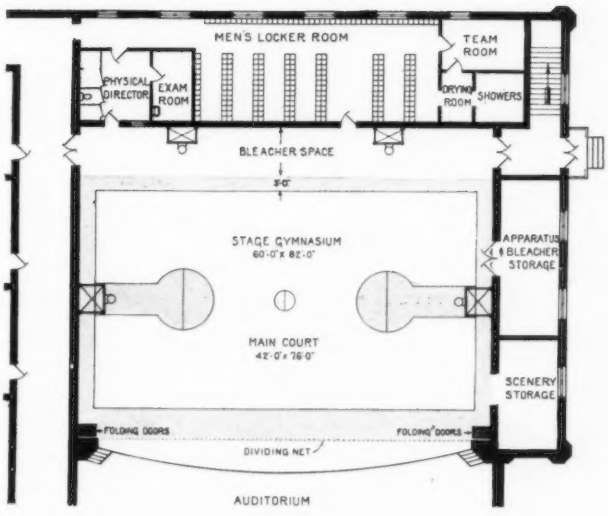
Referring to the table used by Mr. Ackerman in designing the Cornell gymnasium, one sees that certain activities and certain rooms require varying amounts of top lighting, whereas other rooms are served equally well with light from top or sides and in a few cases from the end of the room. This factor not only establishes the location or design of individual rooms, but since the table shows that fully half the rooms should have top light, it eliminates a three-story building (in this case) as a desirable solution unless land costs are a primary factor.

For the basketball court and general-purpose gymnasium room "natural lighting is preferred on the two long sides of the room with a minimum of light at ends. Special care should be taken to protect basketball players against end lighting. Overhead lighting in the gymnasium is the least desirable method of natural lighting." (5)

Natural ventilation requirements limit form

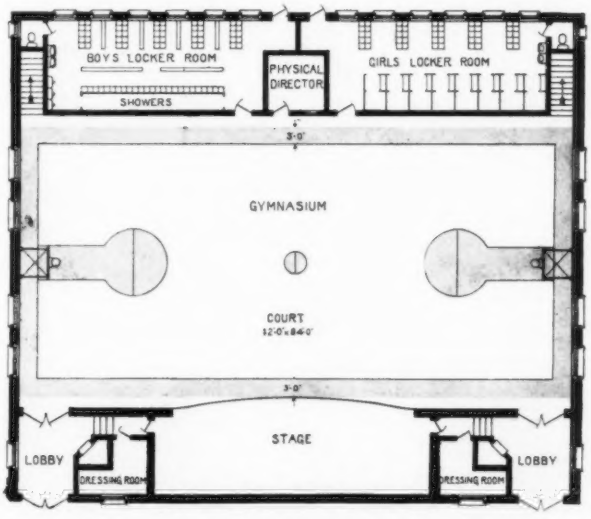
The adequate natural ventilation of rooms of the shape, area and volume given in Mr. Ackerman's table requires the provision of windows in the two side walls.

To permit adequate ventilation "except in the case of rooms that are to be provided with mechanical ventilation, the rooms should be ranged in wings with low corridors along the side so as to allow windows above. Second-floor rooms should be approached by stairs so placed, with reference to a pair of rooms, that second-floor corridors may be reduced to a minimum." (1)



The stage floor is made of ample width and depth to allow its use either as an ordinary stage or as a gymnasium when closed off from the auditorium by folding doors.

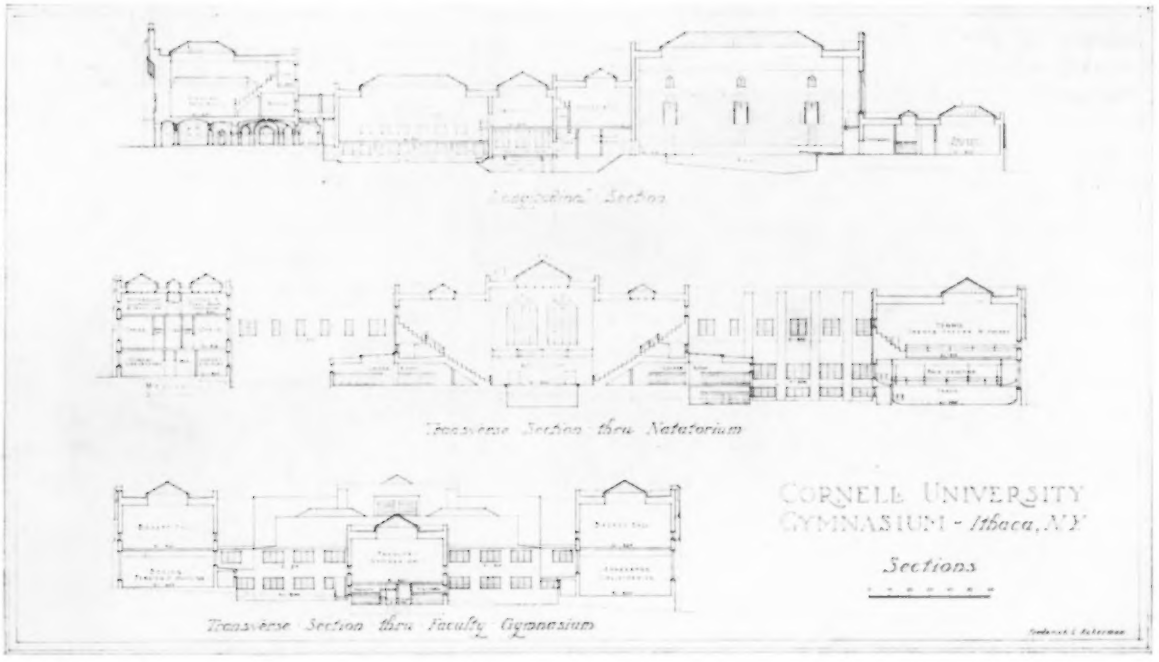
This is no longer considered good practice because of the desirability of the independent use of both gymnasium and auditorium for the larger part of the day.



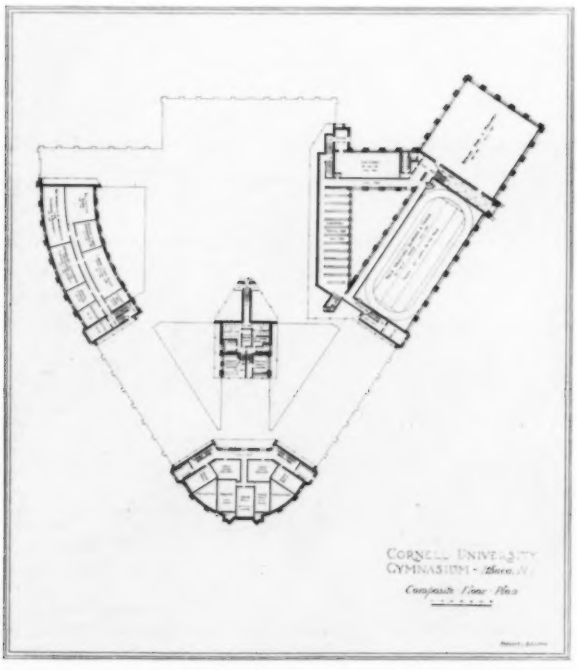
By the use of chairs the gymnasium can be readily converted into an auditorium.

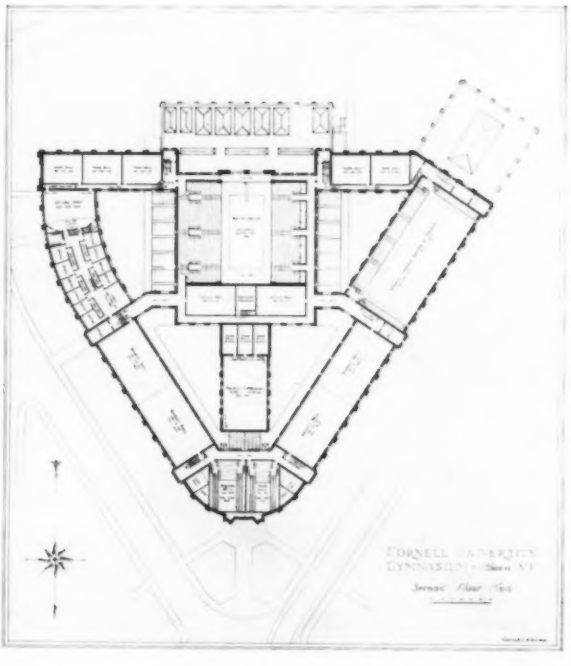
This double use is never very satisfactory but may be employed when funds are limited.

Plans from "Medart Gymnasium Equipment."



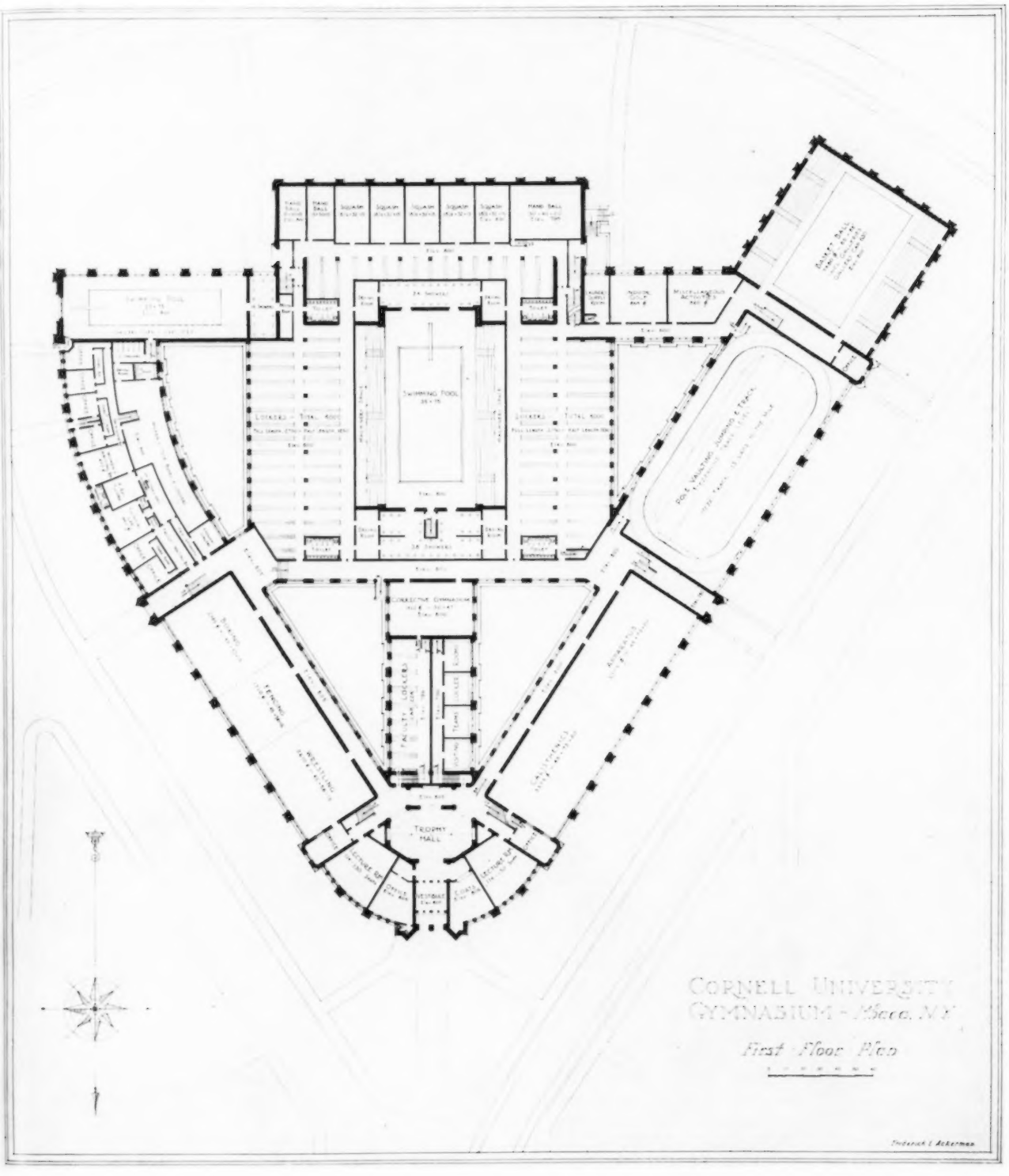
The low first-floor corridor windows permit cross ventilation of the gymnasium rooms.





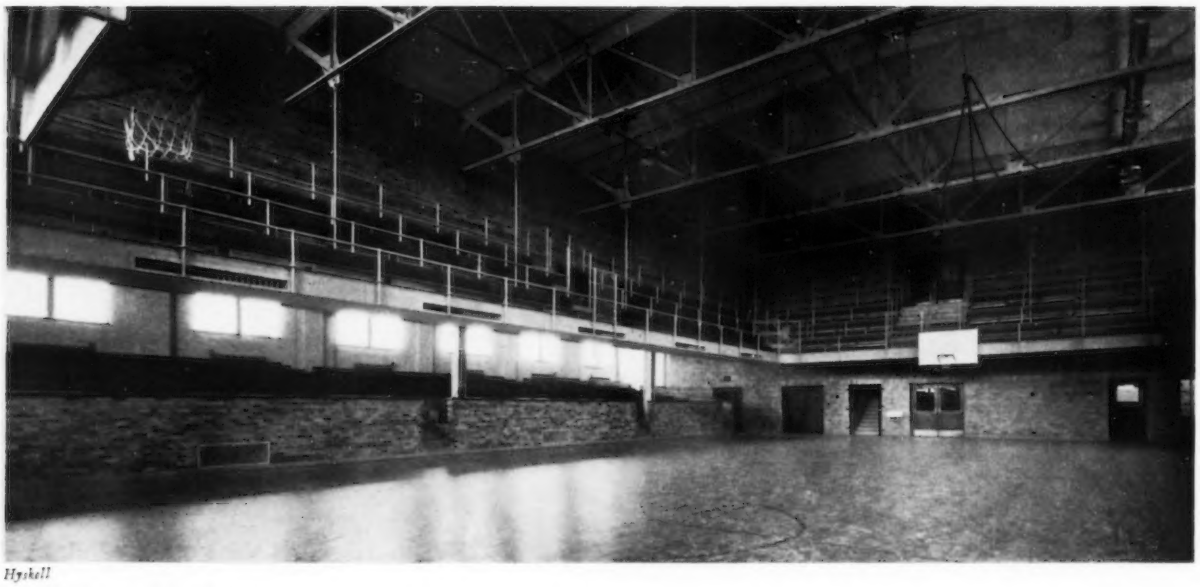
PROPOSED GYMNASIUM
CORNELL UNIVERSITY, ITHACA, NEW YORK
FREDERICK L. ACKERMAN, ARCHITECT

The placing of stairs between pairs of rooms eliminates need of second-floor corridors, thus permitting cross ventilation of gymnasium rooms.



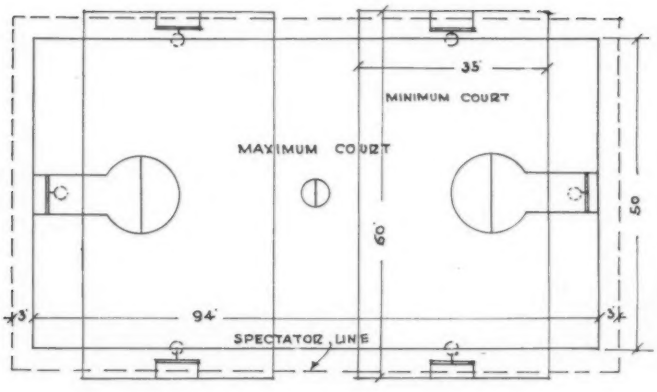
PROPOSED GYMNASIUM
CORNELL UNIVERSITY, ITHACA, NEW YORK
FREDERICK L. ACKERMAN, ARCHITECT

Gymnasium planned to meet requirements set forth in "Tabulation of Requirements of Various Athletic Activities," shown on pages 66 and 67.



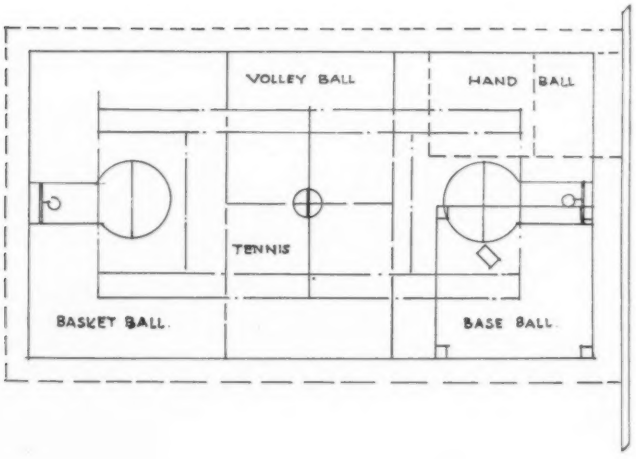
Hyskell

BOYS' GYMNASIUM
EAST HIGH SCHOOL, DENVER



SPACE REQUIREMENTS OF BASKETBALL GAMES DETERMINE SIZE OF MAIN GYMNASIUM FLOOR.

Maximum and minimum basketball court sizes. The large court may be used for exhibition games and the two smaller courts for minor or practice games.



Basketball court for exhibition games is large enough for other sports.

Basketball court determines size of main gymnasium floor

In determining the requisite size and shape of a gymnasium floor the requirements of basketball are practically always the determining factor. There are several reasons for this. In the first place, most of the other sports using the main floor will readily fit into any size and shape of space that is found suitable for basketball, whereas the reverse is not always true. In addition, basketball is not only the most important indoor sport, but physical directors agree that from the standpoint of contributing to the all-round development of the student, basketball is the best of all the indoor gymnasium sports.

Other facilities

The selection of other facilities to be incorporated in a gymnasium building for diversified activities will be largely a problem to be decided by the building committee. But the efficiency ratings of the various facilities given in the tabular questionnaire (see pages 66 and 67), together with the accompanying chart showing the value of the various activities, should assist the architect in advising what facilities should be included or omitted in any particular building.

Area cut-outs aid planning

Having determined the areas of the facilities to be provided (see pages 66 and 67), the architect may find assistance in the development of a logical scheme if cardboard cut-outs to scale are prepared for the various rooms. These cut-outs can be colored or otherwise treated to indicate requirements for height, lighting and ventilation.

REQUIREMENTS FOR BASKETBALL COURTS

OFFICIAL COURT SIZES

"The playing court shall be a rectangular surface free from obstructions and shall have maximum dimensions of 94 feet in length by 50 feet in width and minimum dimensions of 60 feet in length by 35 feet in width.

NOTE: By mutual agreement of the captains, Section 1 and the distance of the boundaries from obstructions named in Section 2, may be changed.

The following dimensions are considered ideal for teams whose players are of the age indicated for each group:

1. Elementary school age	40 by 60 feet.
2. High school age	48 by 75 feet.
3. College age	48 by 84 feet.

"These are the dimensions for the playing court only. . . . There shall be at every point at least 3 feet from any obstruction to the playing court . . . In planning the gymnasium, at least 10* additional feet should be provided on each side and each end." (7). In addition there should be allowance for portable bleachers or balconies.

*The Architectural Bureau of the Y. M. C. A. feels that while 10 feet or more may be desirable for school or college gymnasiums this space is not essential in their gymnasiums in most instances where spectator space is a secondary consideration.

EXHIBITION AND PRACTICE COURTS

"The ideal floor is one so proportioned that two or possibly three official basketball courts can be laid across the width of the gymnasium. These courts should have a minimum 6-foot spacing between adjacent side lines and a 3-foot minimum clearance between the side lines and the end walls. The exhibition court is then laid longitudinally with the gymnasium." (2)

Except for exhibition games the gymnasium floor is divided by folding partitions or a dividing net stretched between courts to keep play on one court from interfering with play on another court. Of some 20 institutions dividing their floors, it was found that 16 use nets, 2 use doors, and 2 use canvas curtains. The recommendations likewise favor the net but 12 prefer not to use any method of division. (1)

NUMBER OF BASKETBALL COURTS

A recent survey shows the desire on the part of athletic directors to double the number of basketball courts now available. (1)

SIZE OF BASKET BALL COURTS IN EXISTING GYMNASIUMS

The median size for present courts is 48 feet by 85 feet. Several of the smaller colleges favor 45 feet by 85 feet, although the recommended median size is 50 feet by 90 feet. (1)

BACKBOARDS: SIZE AND MATERIAL

"Backboards must be provided, the dimensions of which shall be 6 feet horizontally and 4 feet vertically. These backboards shall be made of plate glass or wood, or of any other material that is flat and rigid. The faces of the backboards shall be painted white." (7)

POSITION OF BACKBOARDS

"The backboards shall be located in a position at each end at right angles to the floor, parallel to the end lines, and with their lower edges 9 feet above the floor. Their centers shall lie in the perpendiculars erected at the points in the court, 2 feet from the midpoints of the end lines. The faces of the backboards shall be 15 feet from the far edges of the free throw lines." (7)

SPECTATORS KEPT 3 FEET FROM BACKBOARDS

"The backboards shall be protected from spectators to a distance of at least 3 feet behind and at each end." (7)

REQUIREMENTS FOR GYMNASTIC ACTIVITIES

CEILING HEIGHT

"Dropped beams or pipe hangers on which suspended equipment is attached should never be less than 18 feet from the floor. The ideal height is 20 feet to beams or ceiling, and 22 feet is the maximum. Where greater ceiling heights are used it is necessary to provide expensive and unsightly pipe hangers dropped from the beams for the proper attachment of suspended equipment." (2)

The questionnaire sent out to physical directors indicated that "ceiling height (in existing gymnasiums) showed considerable range; the upper height varying from 20 to 65 feet and the apparatus supports varying from 18 to 30 feet. The median figure for the upper or peak height was 30 feet and for the apparatus supports 22 feet. The recommended heights approximated these figures." (1)

WALLS

The walls to a height of 6 feet should be left as clear as possible to permit the installation of gymnasium equipment. "In a well-planned gymnasium, the only breaks in the walls which should interfere with the placing of gymnasium equipment are doors, which should be limited in number." (2) In school and Y. M. C. A. gymnasiums a window is frequently provided through which the physical director can obtain a full and unrestricted view of the gymnasium floor while seated at his desk, but this is seldom done in college gymnasiums,

The doors should be at the corners of the room to facilitate placing of bleachers.

RUNNING TRACKS AND BALCONIES

There is a decided tendency to eliminate running tracks and spectators' balconies in the newer gymnasiums. The running track is being omitted as the expense is not justified by the amount of use, and spectators' balconies have little value, as generally only a partial view of the first floor is obtained except by those in the front row.

Should special considerations warrant the inclusion of the balcony or running track it should not exceed 6 feet 6 inches width for a 60 by 90 foot gymnasium or smaller, as it will seriously interfere with basketball. The ideal clear height above the floor is 12 feet. The balcony should in no case have less than 10 feet in the clear from the underside as a lower height would prevent the attachment or installation of certain pieces of equipment.

STORAGE SPACE FOR GYMNASIUM EQUIPMENT

One of the most common errors in gymnasium design has been the failure to provide sufficient space for storage of gymnasium apparatus. For the ordinary gymnasium not over 60 feet by 90 feet in size the apparatus storage room should approximate 400 square feet in area. The door should be at least 5 feet in the clear. The flooring of the gymnasium should extend into the storage room on the same level without a break or sill.

SEATING ACCOMMODATIONS FOR SPECTATORS

BLEACHERS

The proper handling of spectators is an important item in the design of a gymnasium. For the large gymnasium or building containing several gymnasium floors the problem is comparatively simple, since one of the rooms may have permanent seats. For the small gymnasium where space and money are limited, the provision of adequate spectator space may be a problem. However, it should not be overlooked that adequate spectator space may be a real income-producing asset to a club. Failure to make ample provision for space for bleachers may be a penny-wise and pound-foolish policy.

There are three major types of bleachers in use: the type that hooks into the wall, the roll type and the portable type. Up to five-row capacity, the type that hooks into the wall requires less storage space and is probably less expensive. Beyond this height it is necessary to install intermediate supporting horses which reduce this saving as the height increases. The Y. M. C. A., which seldom has over five-rows bleacher capacity, favors the wall-attached type of bleacher but this type lacks the flexibility of use of the portable type which may be arranged in different ways, either for interior or exterior use.

STORAGE SPACE REQUIRED FOR BLEACHERS

It is very important when planning a gymnasium to provide ample storage space for bleachers whether they are included in the original contract or not. The floor area of the storage for wood bleachers should be one-eighteenth of the floor space occupied by bleachers when erected. (Steel bleachers require one-thirteenth.) As most bleachers come in 16-foot sections, it is advisable to have the storage room 18 feet long. The width may vary according to the requirements of the particular plan.

The accompanying plan shows that spectator entrances at the corners of the gymnasium will give a greater number of seats with good view than spectator entrances at the center of the gymnasium. Entrance aisles at the corners also add to the visibility of corner seats. Consideration should be given to proper location of doors in relation to bleachers even if they are not in the original specifications or contract, as there are cases where failure to consider their installation has resulted in a serious handicap at a later date when bleachers were installed.

It will be noted from the accompanying plan that the section with entrances at the corners permits 13% more seats and a larger proportion of the seats have good vision than the section with the center entrance.

MINOR ATHLETIC ACTIVITIES

VOLLEY BALL

The playing surface for volley ball, 30 by 60 feet,* is almost identical with the minimum court size for basketball, 35 by 60 feet.

HANDBALL

"The standard game of handball is played in a four-wall court, 15 by 15 by 30 feet, but a simple and entirely satisfactory handball game is played with one, two or three walls. In fact, the demand for handball courts in college gymnasiums has been so great during the past few years that courts have been improvised wherever a smooth wall of at least 150 square feet and a distance of 25 or 30 feet of floor space could be found.

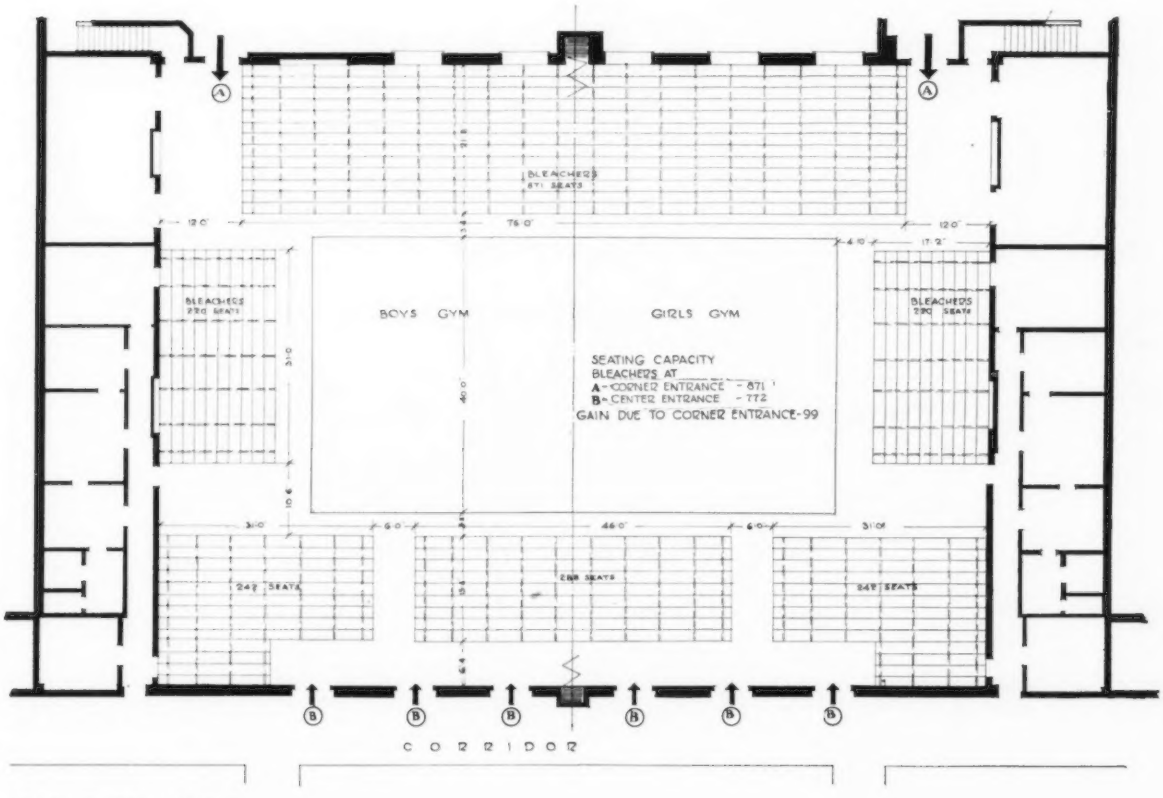
"In planning a new gymnasium building for a college or school, one standard handball court might be provided for each four hundred students and faculty. In addition to the standard four-wall courts, one long wall in every gymnasium should be constructed of smooth material and as many one-wall handball courts as possible be laid out on the wall and floor. These courts can be used when the gymnasium is not in use for classes or basketball.

"A good size for a one- or two-wall court is 16 by 20 feet for the playing space on the wall and 20 by 34 feet on the floor. There should be at least 10 feet of clear space behind the back line on the floor."

*The size of the court may be modified for either indoor or outdoor informal games to accommodate larger or smaller groups to suit local requirements. It is urged that the standard size court be used in all match games, where possible. (8)

SQUASH RAQUET AND SQUASH TENNIS

These two games are gaining in popularity very rapidly. The space to be provided will depend on local conditions and policy of the athletic director.



BLEACHER LAYOUT

BENJAMIN FRANKLIN HIGH SCHOOL
ROCHESTER, NEW YORK
EDWIN S. GORDON, ARCHITECT

Corner entrance "A" gives better seating arrangement than center entrance "B".

CORRECTIVE GYMNASIUM

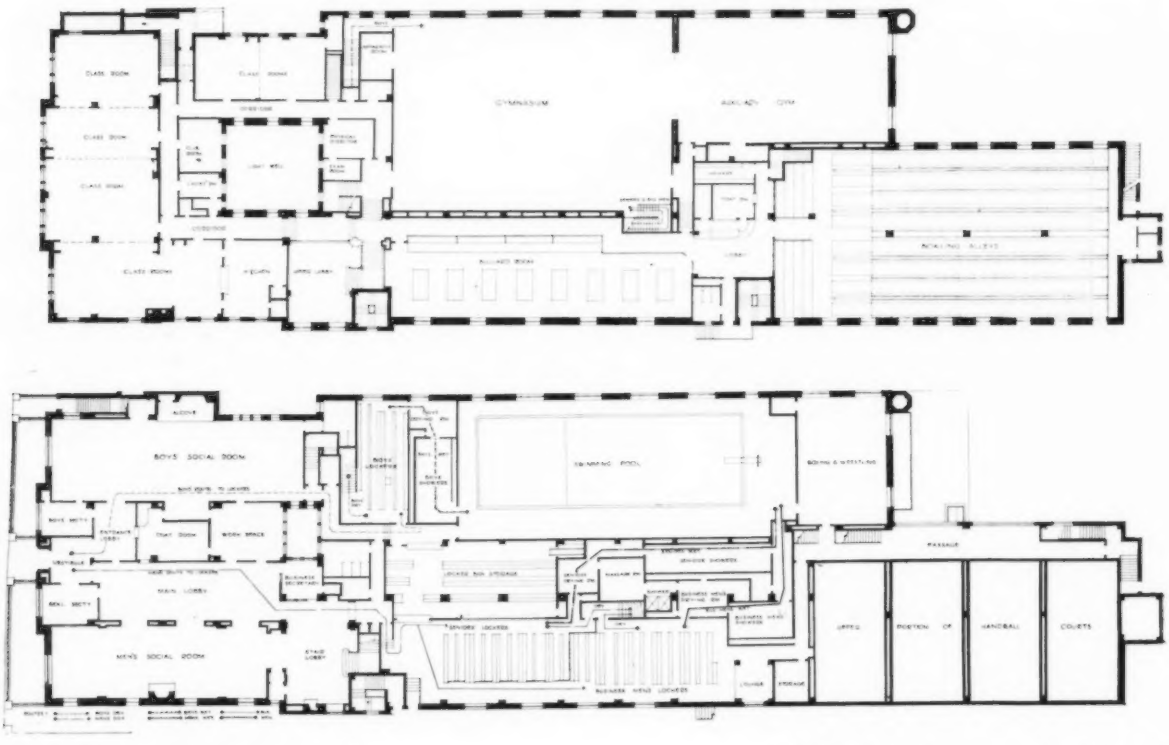
A room preferably approximately 25 by 50 feet should be provided for individual student work or for the work of smaller groups needing special corrective attention.

DIRECTOR'S OFFICE

"The efficient administration of the physical training department depends in large measure upon the location of the offices of the physical directors in relation to the rest of the rooms of the department. The offices should be easily accessible to gymnasiums, dressing room, anthopometric or examining room and athletic field. Each gymnasium should be provided with separate director's office so located as to permit a view of gymnasium floor." (5)

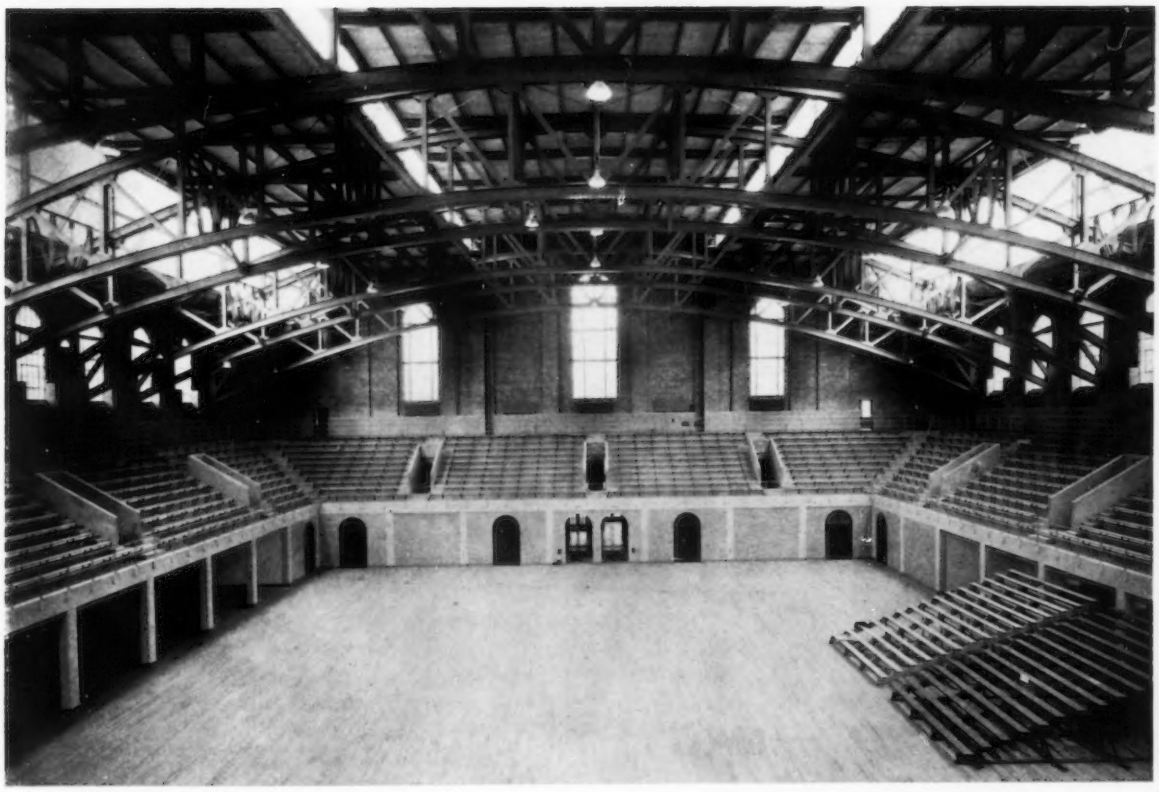
Equipment should consist of instructor's desk, instructor's chair, visitors' chairs, filing cabinet, bookcase, first-aid cabinet. In the smaller gymnasium where separate storage facilities are not provided for athletic supplies, the director's office should have a cabinet for storage of basketballs, handballs, indoor baseballs and other similar gymnasium equipment. Provision should also be made for locker and shower in lavatory for physical director.

MEN'S RECREATION BUILDING
PENNSYLVANIA STATE COLLEGE
CHARLES Z. KLAUDER, ARCHITECT



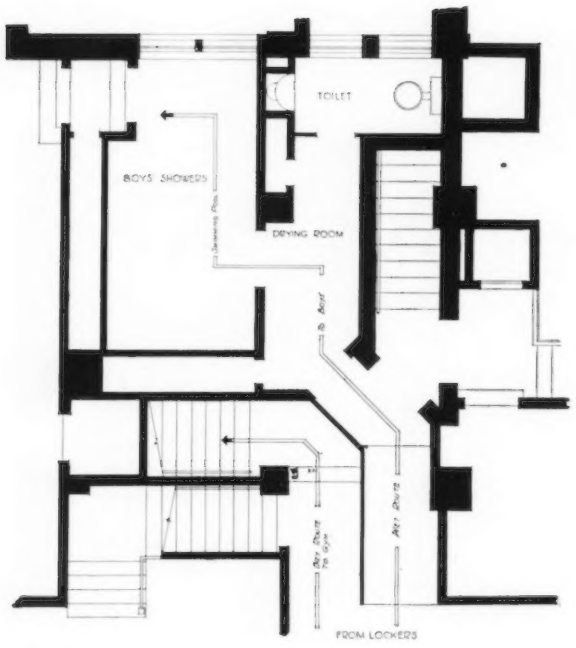
Y. M. C. A. BUILDING
GERMANTOWN, PENNSYLVANIA
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS

Traffic lanes for men and boys kept entirely separate.

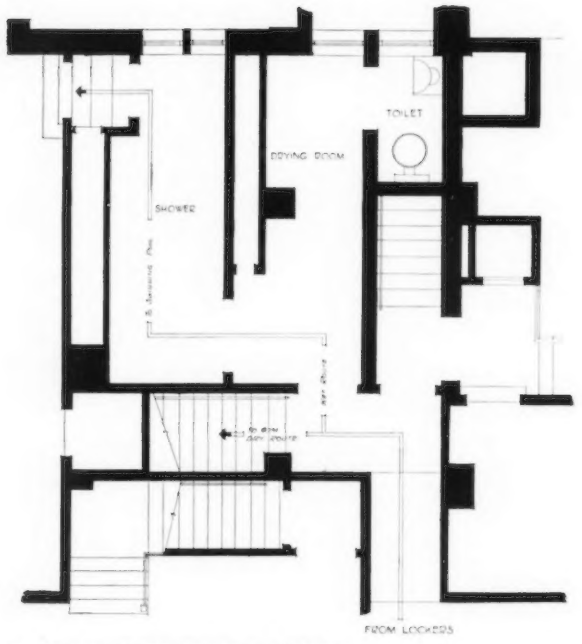


MEN'S RECREATION BUILDING
PENNSYLVANIA STATE COLLEGE
CHARLES Z. KLAUDER, ARCHITECT

Portable bleachers may be used in addition to permanent seating arrangement.



PLAN A—ORIGINAL LAYOUT
Y. M. C. A. BUILDING, EASTON, PENNSYLVANIA
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS



PLAN B—IMPROVED LAYOUT
Plan changed to obtain separation of wet and dry traffic lanes.

EXAMINATION ROOM
This should be located adjoining the physical director's office, with access from the locker room. It should be equipped with scales, lounge, rest chairs, first-aid cabinet and all equipment necessary for physical examination.

TRAFFIC CIRCULATION IN A GYMNASIUM

The ideal plan is one in which corridors are eliminated. Although it is not possible to eliminate corridors entirely, "second (or third) floor rooms should be approached by stairs so placed with reference to a pair of rooms, that second (or third) floor corridors may be reduced to a minimum." (1)

"When it is necessary to cross wet or muddy ground before reaching the lockers or gymnasium, ample provision must be made on the line of circulation for the storage of overshoes, or the cleaning of shoes, and the member must be able to go to his locker and from his locker to the gymnasium without having to pass over the space that he has already walked on, thus avoiding tramping mud into the gymnasium." (10)

Consideration should be given to the proper routing of spectator and participant traffic. The latter should be further separated into independent circulation systems for men and women or men and boys when there is a dual use of the building. Each of these classes should have further separation between wet and dry traffic from locker room to swimming pool or gymnasium.

Routing of persons from the entrance to locker rooms is a comparatively simple matter for most gymnasiums, but for gymnasiums handling two or more classes of memberships (such as co-educational schools or the Y. M. C. A. and Y. W. C. A.) it is very desirable to provide for complete separation of the different classes of users. In association buildings separate entrances for the boys and men should be provided whenever the site conditions permit. When this is not possible, it is well to separate the two classes of membership as near the entrance as possible.

Traffic to and from the gymnasium should not cross the traffic to and from the showers and swimming pool, as water may be tracked on to gymnasium floors.

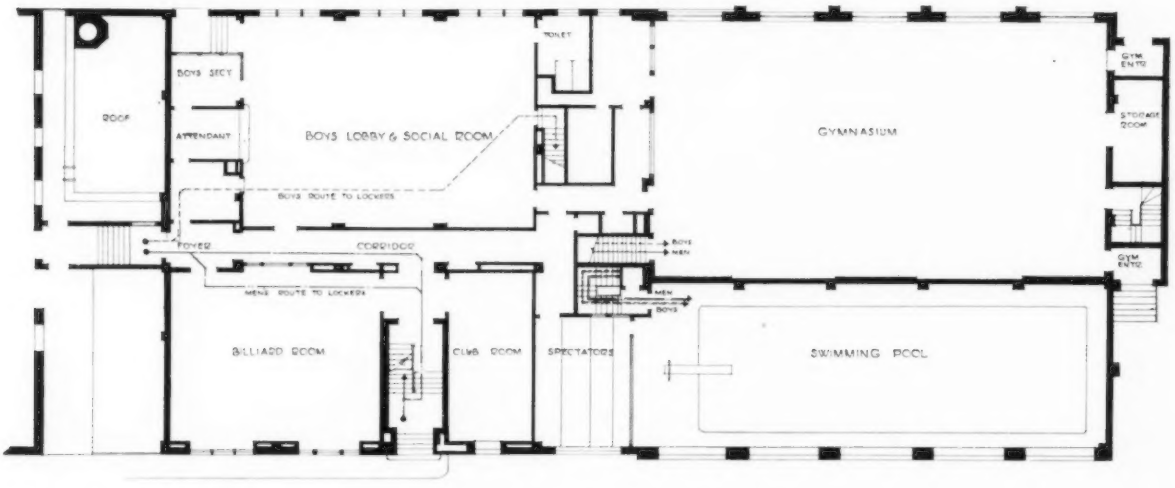
When two classes of membership use the same gymnasium, separate means of circulation should be provided between locker rooms and gymnasium or pool when possible, although compromises will have to be accepted at times due to site conditions or other limiting factors.

Plan A, Y. M. C. A., Easton, Pa., shown above, shows the original traffic arrangement on a limited site, and Plan B shows how this was modified to obtain a greater degree of separation, even under very limited conditions.

Traffic circulation for spectators is not a serious problem in most association or school buildings, but for the larger high school or college gymnasiums or gymnasiums used as auditoriums considerable thought should be given to this problem to prevent congestion at any point. For the dual-use gym it is frequently desirable to have special exits from the gym floor to the outside for use of audience or spectators. It is also well to consider the location of public toilets in relation to spectator space, as the general public should not be admitted to the toilets off the locker rooms. Public traffic should be entirely separated from the circulation to and from the gym floor.

In planning circulation for boys as much of the stair and hall space should be open to observation by attendants as can be conveniently arranged. The arrangement in plan shown below is such that a large portion of circulation is visible to the tote-box attendant.

Traffic lanes to the pools should always enter through the drying and shower rooms. Where pools are to be used by both adults and children, as in schools or the Y. M. C. A. or Y. W. C. A., it is well to have the adults enter the pool room at the deep end of the pool and the younger group enter at the shallow end. (See page 76.) Stairs should be avoided when possible between locker room and pool, as there is always a danger of slipping.



FIRST FLOOR PLAN

BASEMENT PLAN

Y. M. C. A. BUILDING, NORRISTOWN, PA.
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS

Plans showing careful study of traffic requirements. Traffic lanes to swimming pool should always enter through drying and shower rooms.

CONSTRUCTION OF GYMNASIUM FLOORS

SELECTION OF WOOD

"If there is one element upon which there is general agreement it is the use of maple wood as the top flooring. Hard pine and oak are also used, but should be avoided as they splinter." (1)

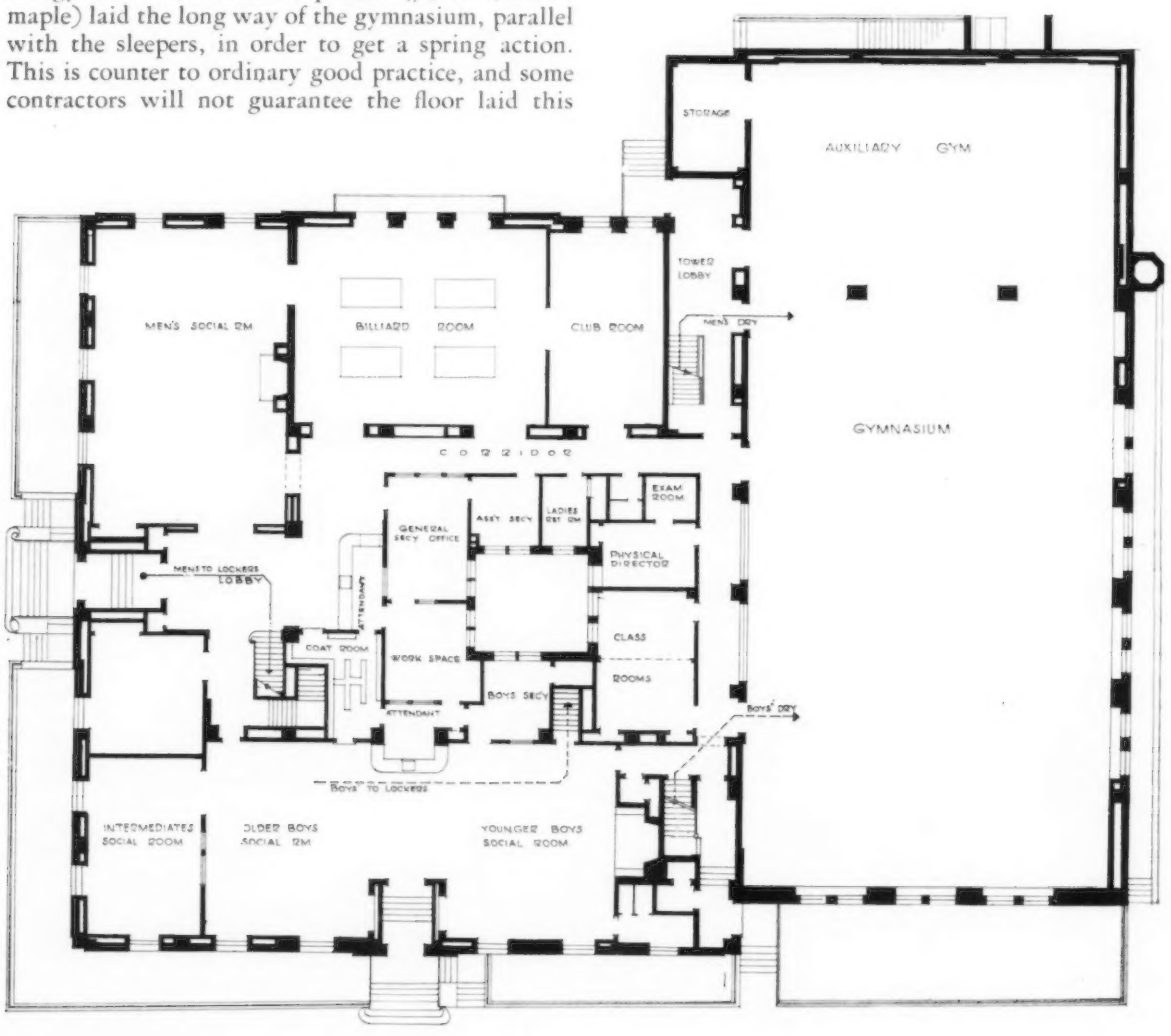
SINGLE OR DOUBLE FLOOR

There is a difference of opinion as to whether a single or double floor should be used. It is a problem of getting a floor which will stand concentrated loads, from heavy floor apparatus, or the vertical lifting strains of floor-guyed pieces, and yet have sufficient spring to be comfortable for the players.

If double flooring is used the sub-floor should be laid diagonally over sleepers laid the long way of the gymnasium, and the top floor (⅞ to 1⅛-inch maple) laid the long way of the gymnasium, parallel with the sleepers, in order to get a spring action. This is counter to ordinary good practice, and some contractors will not guarantee the floor laid this way; but there are many gymnasiums where this type of floor has been used for some years with entire satisfaction.

"If a double floor is not used, the single floor should be of hard maple not less than 1½ inches thick. To prevent single flooring from pulling up when subjected to vertical strains, the ends of all boards should terminate directly over the wood joists." (2)

Y. M. C. A. on corner lot. Entrance for men on different street from boys' entrance, with complete separation of facilities which is desirable.



Y. M. C. A. BUILDING, WILLIAMSPORT, PENNSYLVANIA
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS

FLOOR FINISH

Oil varnish and natural finish are nearly equal in popularity. (1)

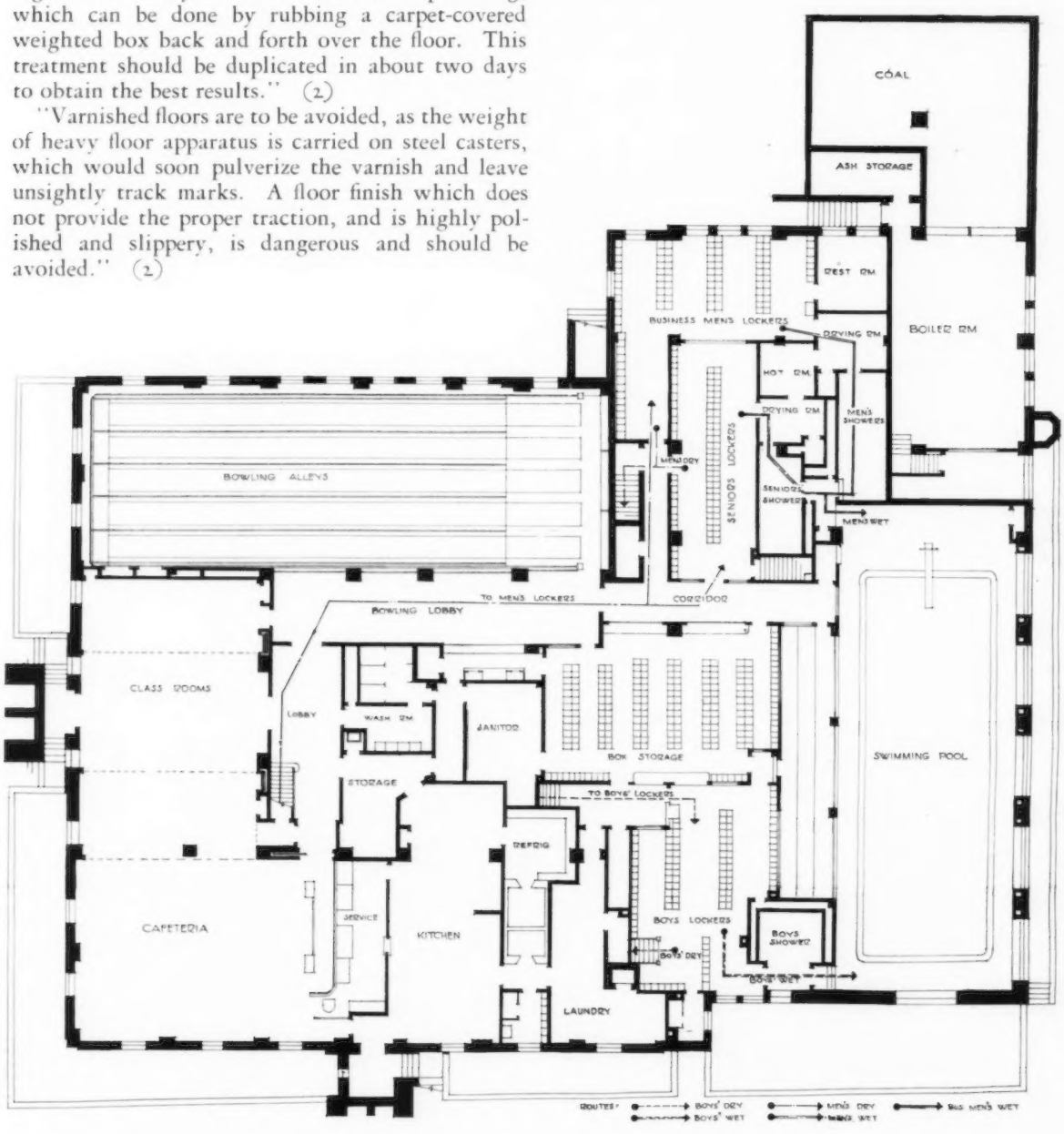
"Raw linseed oil has been commonly used for finishing the floor. This is best applied at or near the boiling temperature by one person, a light coat being brushed on with the grain of the wood. Before this has had a chance to cool the oil which has not instantly penetrated the floor should be wiped off by a second workman. A third workman should follow the second, vigorously and thoroughly wiping the floor dry. The final finish is polishing, which can be done by rubbing a carpet-covered weighted box back and forth over the floor. This treatment should be duplicated in about two days to obtain the best results." (2)

"Varnished floors are to be avoided, as the weight of heavy floor apparatus is carried on steel casters, which would soon pulverize the varnish and leave unsightly track marks. A floor finish which does not provide the proper traction, and is highly polished and slippery, is dangerous and should be avoided." (2)

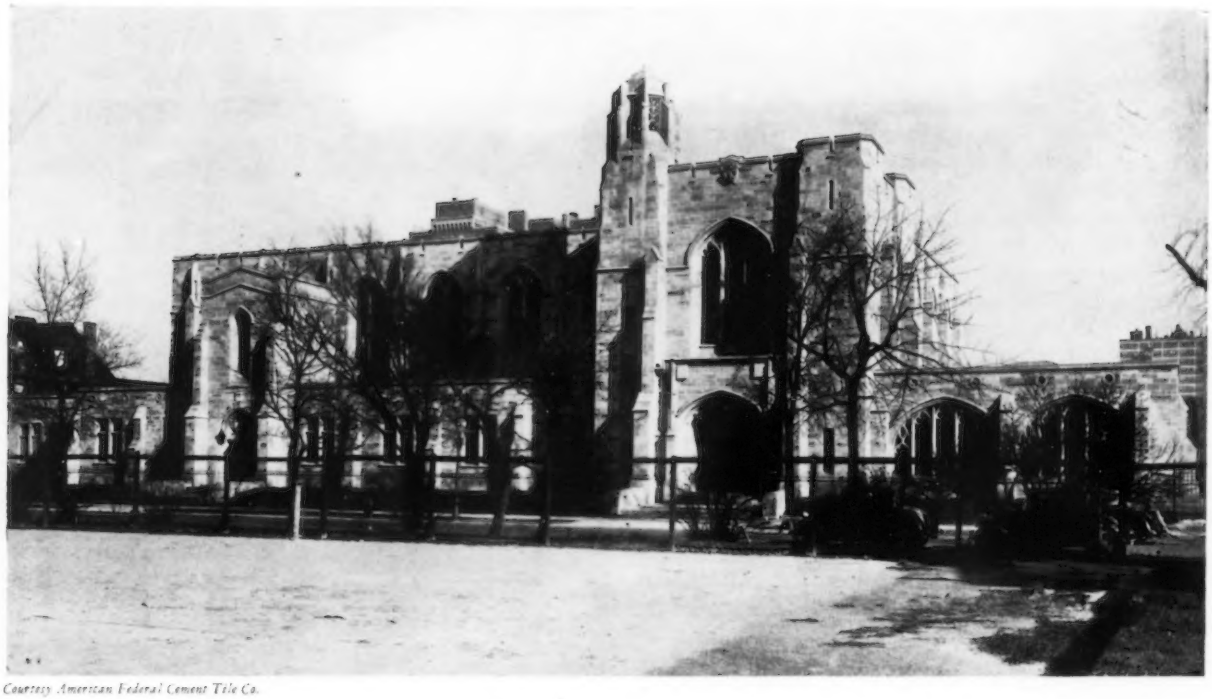
BASE ANGLE

A 2-inch by 4-inch angle iron with the 4-inch side up should be placed against the wall, as heavy movable floor apparatus have extended iron bases which will damage a wooden base.

Separation of wet and dry routes prevents tracking dirt into swimming pool and water into gymnasium.



Y. M. C. A. BUILDING, WILLIAMSPORT, PENNSYLVANIA
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS



Courtesy American Federal Cement Tile Co.

GYMNASIUM, UNIVERSITY OF CHICAGO

WALL CONSTRUCTION

The tendency in recent gymnasiums, according to some authorities, seems away from the use of equipment attached to the wall and towards the use of free-standing portable equipment. When this is the case, a glazed tile* will frequently be found a satisfactory material to use on account of the larger size of the units, but brick is generally preferable when considerable heavy equipment is to be attached to the wall.

Cork has been used as a wall covering in some gymnasiums. It may be applied directly to the masonry or to sheathing boards furred out from the masonry wall.

*Regarding the use of tile walls, the Narragansett Machine Co. writes—"If you could live in our business for a few weeks, we think you would more strongly discourage the use of hollow tile for interior gymnasium walls. If you erected a gymnasium to be used for nothing but basketball without a single piece of gymnasium apparatus, you would find hollow tile walls would not hold basketball backstops which in the great majority of cases are braced out from the walls by means of pipe arms or brackets. We also believe that you should go very slowly on such new ideas as cork facing for gymnasium walls."

As most gymnasiums are not kept warm at all times, it is desirable to have a wall surface that is easily heated. The surface of a wood or a cork-over-wood lining to a masonry wall can be brought to room temperature in approximately 10 minutes, whereas if brick were substituted for the wood or cork lining it would take from 6 to 8 hours to bring the surface to room temperature (utilizing in both cases twice the amount of heat that would be required to maintain an even temperature once the wall were warm). (14) This not only effects a saving in cost of heating the room to the desired temperature, but practically eliminates danger of moisture condensation. The room is also more comfortable, for even though the air temperature may be satisfactory a cold masonry wall absorbs more radiant heat from players' bodies than a wood or cork-surfaced wall. Cork has the additional advantage of lessening the reverberation of a gymnasium room. This is an important problem when the gymnasium is used for both auditorium and gymnasium purposes.

In order to obtain a light-colored wall which is

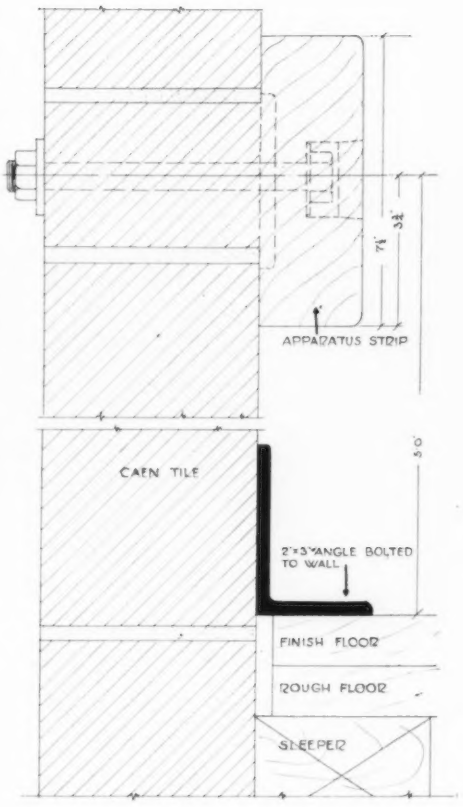
sound-absorptive and yet washable, it might be desirable to use cork carpet for wall covering. Whatever the surface used, it should be one that can be washed easily, as the walls become soiled very quickly from dirt-covered basketballs or indoor baseballs. Paint is generally unsatisfactory as it costs too much to be kept looking well.

APPARATUS STRIP

If wall apparatus, such as pulley weights, mat hangers, wand racks, etc., are to be used, it is advisable to install a heavy 8-inch wide apparatus strip centered 5 feet from the finished floor. This strip should extend around the entire gymnasium and should be bolted direct to the walls. To prevent injury due to projecting bolt heads, the bolt holes should be countersunk so that the heads of the bolts are flush with the face of the apparatus strip.

DOORS

Doors to a gymnasium room or exercise room should open out, as there would be danger of a player being injured by running into a door opened inward by someone entering the gym. Doors to shower rooms or swimming pools should be covered with a rustless metal such as copper, aluminum, or chromium nickel steel.



DETAIL OF APPARATUS STRIP BASE ANGLE AND FLOORING
Y. M. C. A., GERMANTOWN, PA.
THOMAS, MARTIN AND KIRKPATRICK, ARCHITECTS

ROOF USED AS GYMNASIUM

There is a decided tendency in many cities to utilize the roof space of school, club or gymnasium building for exercise space. When this is done, there is always the problem of providing a suitable playing surface which will be weatherproof and withstand the action of sun and freezing. One of the most satisfactory methods of treating such a roof has been to use wood ship-decking. The entire roof should be covered with netting to eliminate any possibility of an accident to a player or of a ball getting out and injuring someone on the ground.

The lighting fixtures must be recessed in the guard netting to eliminate any possibility of their being damaged or of their interfering with the gymnasium activities. Naturally special care must be taken to prevent any water entering the fixture. European gymnasiums make provision generally for sun baths on gymnasium roofs.

DAY-LIGHTING A GYMNASIUM

WINDOWS

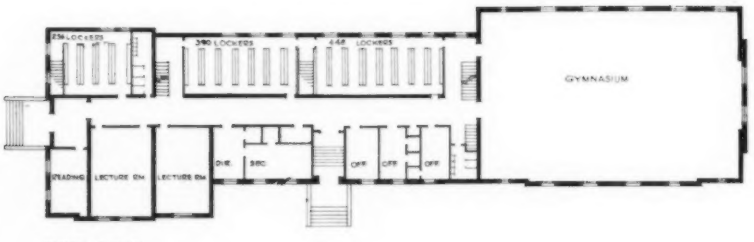
In recent gymnasiums "the side wall area used for windows approximates 25%. The median of both present and recommended height of windows above the floor is 6 feet. Where balconies or tracks are present, 15 feet is the median." (1)

Courtesy American Federal Cement Tile Co.

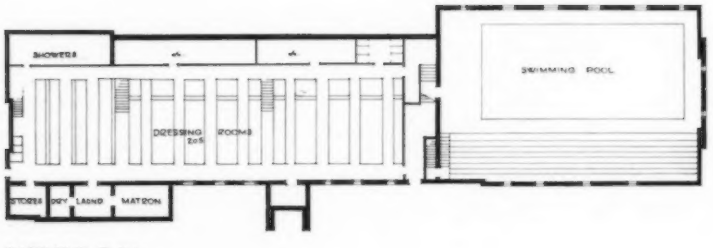
ROOF CONSTRUCTED OF FEATHERWEIGHT CONCRETE INSULATING ROOF SLABS

MEN'S GYMNASIUM

WOMEN'S GYMNASIUM



FIRST FLOOR



BASEMENT PLAN

PLANS OF WOMEN'S GYMNASIUM
UNIVERSITY OF COLORADO
DAY AND KLAUDER, ARCHITECTS

The louver type of window with mechanical operation is the best type for use in the large gymnasium room as the windows may be operated without opening the guard netting. The windows may also be opened for ventilation in rainy weather without danger of rain blowing into the gymnasium. In the large gymnasiums these windows can be operated electrically.

If the locker room is on the first floor or basement, double-hung windows should be avoided since they give no privacy when open. It is better to pivot the windows so that they screen the interior of the room when open. They should be high enough so that persons using the room will not cast shadows on them, and of obscure glass, rough side out to prevent dirt settling on the inner surface. Allow for fly screens and winter sash.

WINDOW SCREENS

"When windows are washed, the screens should slide out of the way, rather than swing, to fall back into place when the washing is done.

"These screens should be built on a heavy angle iron frame and should be made of No. 8 wire at least, to withstand the impact of a shot or a medicine ball. A thinner wire may save a little money in first cost, but will soon fall out of shape.

"The frames, hinges and locks of screens should be secured by expansion bolts in the brickwork, not by means of screws in wooden plugs." (10) Here is one of the chief sources of trouble in installation of gymnasium fixtures and equipment.

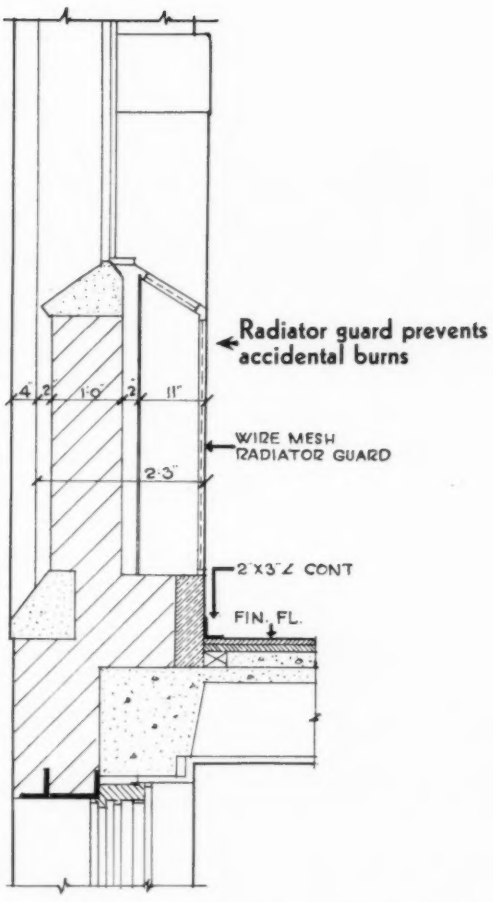
SKYLIGHTS

"The objection to skylights, besides leakage which can generally be avoided by correct design, is loss of heat. Most gymnasiums having skylights are cold, as the cold drops from the skylights very rapidly." (10)

Also it is difficult to wash a skylight without wetting the floor. It would seem advisable for gymnasiums to follow the lead of most of the newer industrial plants, which are abandoning skylights for saw-tooth construction or monitors with the glass perpendicular. This method of lighting has the advantage of being less liable to leak, and there is less difficulty encountered in preventing condensation water dripping on to the floor. With either the saw-tooth or the monitor type of overhead lighting, it is easier to get proper ventilation and double windows cut down the heat loss.

GLASS WALLS

The side walls of the gymnasium might well be built of some of the newer forms of hollow glass units now on the market. (See pages 59 to 62.) These will not only furnish sufficient heat insulation better than glass windows, but some of these units are sufficiently strong to withstand any shock they may be subjected to. If such a wall were to be used, it would be advisable to have a channel or "T" beam in the wall 5 feet from the floor for the attachment of apparatus.



SECTION THROUGH RADIATOR ENCLOSURE
WHITE PLAINS HIGH SCHOOL, NEW YORK
STARRETT AND VAN VLECK, ARCHITECTS

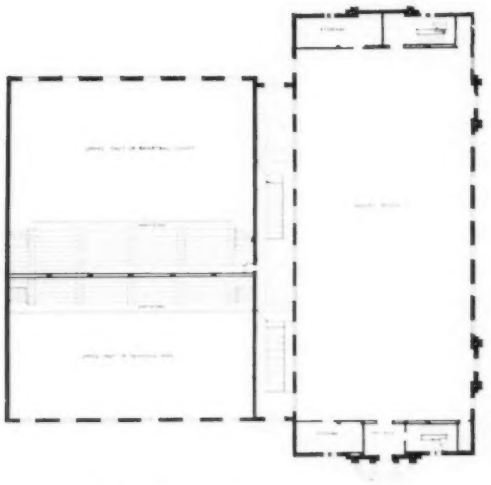
LOCKER ROOMS AND LOCKERS

FOR MEN OR BOYS

The type of locker system used will determine the necessary space, but for preliminary estimate of space requirements for men's gymnasiums the following formula prepared by the Committee on Construction and Material Equipment of the Society of Directors of Physical Education in Colleges will be found useful.

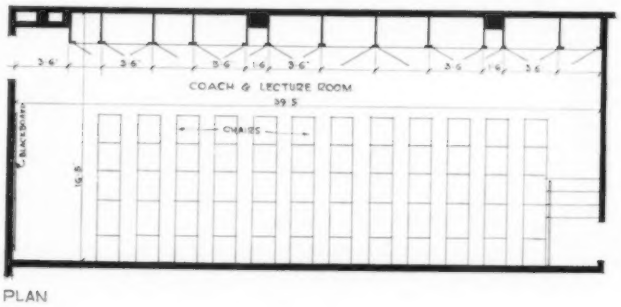
$$\frac{\text{"8 sq. ft. (min. per locker) x no. of lockers}}{\text{32 sq. ft. (min. per student)}} = \text{load that may be carried.}$$

MAIN FLOOR PLAN
GYMNASIUM BUILDING



SECOND FLOOR PLAN

SECTION ELEVATION



PLAN

DETAIL OF COACH'S
LECTURE ROOM

THE HILL HIGH SCHOOL
POTTSTOWN, PENNSYLVANIA
CHARLES Z. KLAUDER, ARCHITECT

"If the resultant or load that can be carried is equal to or exceeds the actual load which will use the locker room at a certain time, 8 square feet will prove a sufficient allowance; but if the resultant is less than the actual load, the allowance per locker must be increased until loads are equalized. For example:

$\frac{8 \times 200}{32} = 50$, load that may be carried.

If the actual load is 100, then 16 square feet will be required per locker. If the actual load is only 40, then 8 square feet will be sufficient." (1)

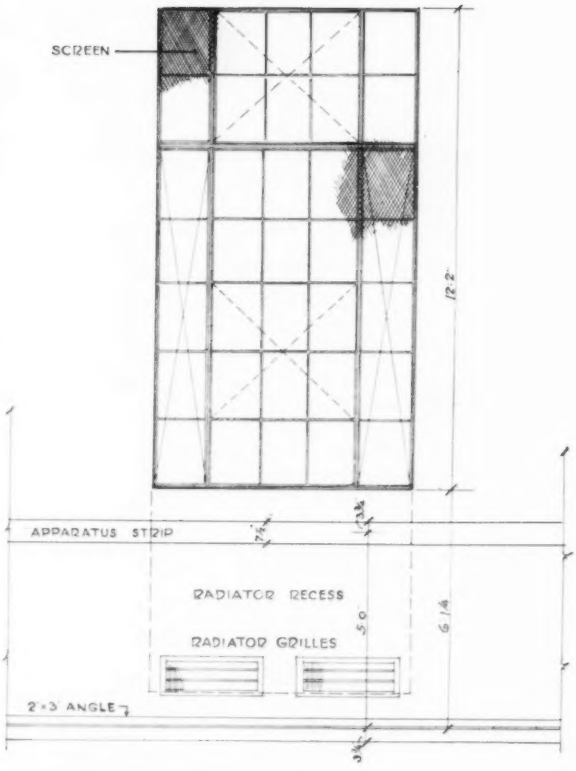
The reason for considering the allowance per locker and per student is that "a locker room built according to an allowance per locker may prove entirely inadequate when the peak load occurs; and likewise, a room built entirely upon an allowance per student may result in a waste of space."

LOCKER ROOMS FOR WOMEN

It is customary to provide private dressing rooms for women, but with changing ideas of modesty this is becoming a less necessary factor and in some cases, especially in the West, the locker systems as used in men's gymnasiums are being installed for women.

There are several types of dressing rooms in use: dressing rooms which contain lockers for the temporary storage of street clothes while the woman is on the gymnasium floor or in the pool and the dressing room which does not contain lockers, the clothes being carried to an outside temporary storage locker. The former type is to be preferred from the standpoint of convenience but when the gym is used continuously it is advisable, with this type, to provide twice as many dressing rooms as the peak load of the gymnasium in order to care properly for incoming and outgoing classes. Where the lockers are outside the booths it is only necessary to provide one-third more dressing rooms than the peak load; but this system is inconvenient, as can be seen from the following discussion of procedure necessary with this type, found in some Y. W. C. A. buildings.

On entering the gymnasium, the woman gets her tote box containing gymnasium suit from a storage rack (generally self-service) in the locker room instead of from a central attendant-controlled locker storage place as in men's gymnasiums. She finds an unoccupied dressing room, where she changes to gym clothes and then carries her clothes to a temporary storage locker outside the dressing room where she also leaves her tote box, taking the key with her. After using the gymnasium she will have to carry her clothes from this locker to some unoccupied dressing room, and later, after taking a shower and dressing, return the tote box to the storage rack. This is inconvenient compared with the system favored by the majority of men's gymnasiums. In addition to the inconvenience of the individual dressing rooms, the cost is considerably more than



ELEVATION OF GYMNASIUM WALL SHOWING RADIATOR RECESSED
Y. M. C. A., GERMANTOWN, PA.
THOMAS, MARTIN, AND KIRKPATRICK, ARCHITECTS

the open type, the installation of individual shower stalls is more expensive, considerable more space is required, and upkeep is more expensive.

Discussion of this problem with the Y. W. C. A. reveals that most of the younger women would not object to the omission of dressing rooms, but the older women, especially those who take gymnasium work for reducing, much prefer the individual dressing room. The solution might be the provision of both types. The men's type is much more convenient for dressing and takes less space than the private room.

One architect says that the majority of school superintendents with whom he comes in contact favor having no more privacy in the girls' dressing rooms than in the boys'. The only difference would be in the shower rooms, where partitions might be installed between the showers. If this system is adopted it would probably be wise to provide special private dressing rooms for use of girls at times when they are unable to use the shower baths. These dressing rooms should be equipped with vending machines for sanitary napkins, lavatory, toilet and incinerator chute. It would be advisable to make

these special dressing rooms easily accessible from the public hall or girls' toilet as well as from the locker room.

In the White Plains High School this problem is met by providing special private dressing rooms equipped with lavatories for some of the girls using the gymnasium.

LOCKERS

The survey conducted by the Committee on Construction and Material Equipment of the Society of Physical Education in Colleges showed that although the majority of recent gymnasiums have been equipped with the permanent type of locker, the majority of physical directors favor the tote-box system. The median of recommended measurement for lockers was 15 by 15 by 72 inches. This same survey found that the combination padlock was gaining favor over the key lock.

Entirely aside from the question of expense of equipment or space occupied by permanent lockers, one factor which influences the choice of the tote-box system is the ability to ventilate properly the tote boxes and to remove odors of stale suits from the dressing room.

LOCKER ROOM FLOORS

In a recent survey concrete was found to be the outstanding material used for locker room floors. Tile, however, is gaining favor. There were a few recommendations for floors covered with linoleum or rubber mats.

The floor should be coved, to facilitate cleaning.

BENCH IN LOCKER ROOM

"The permanent or stationary type of bench is distinctly replacing the movable type." (1)

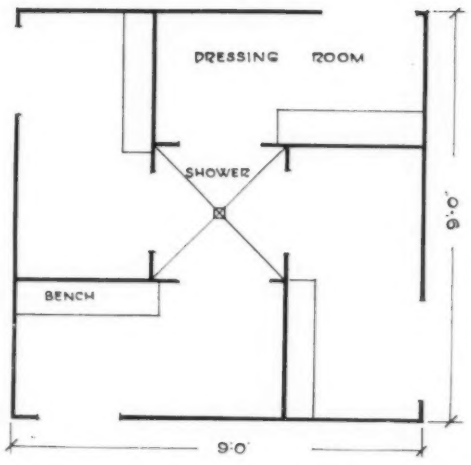
SHOWER ROOMS

FOR MEN

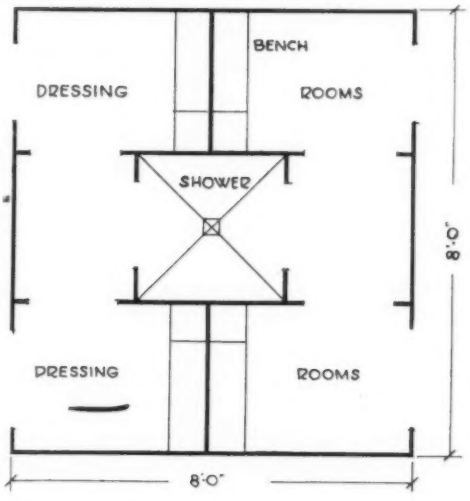
"Present practice indicates the median load per shower to be five men, whereas three is the recommended number. From this we may suggest that the number of showers will depend primarily upon the number of men in the maximum-size class. Thus, if sixty is the largest size class, twenty showers are recommended to facilitate the movement of the class through the shower room. Present construction also indicates the median number of square feet allowed per shower to be twenty-five, which multiplied by the number of showers needed, will give the approximate area required for the main shower room." (1)

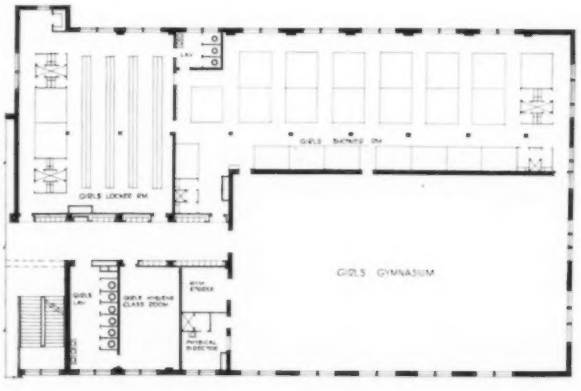
FOR WOMEN

It is customary to combine the shower with the private dressing room. When the shower is used in



SHOWER AND DRESSING ROOMS FOR WOMEN
LOUIS JALLARD, ARCHITECT (10)





GIRLS' GYMNASIUM AND DRESSING ROOM
EAST HIGH SCHOOL, DENVER

connection with a dressing room for a pool there is an exit on the opposite side of the compartment which leads to the pool, thus eliminating any crossing of wet and dry traffic circulation. When the shower is not used in connection with dressing rooms for swimming pools it has only the entrance from the dressing rooms.

SHOWER EQUIPMENT

"The group type of shower, or as some prefer, the individual shower as distinguished from the individual stall type, is nearly a universal choice. A few schools prefer the individual stall." (1) The individual stall type is more favored for use in women's shower rooms.

Speaking of mixing valves, the architectural bureau of the Y. M. C. A. says: "We have been getting very satisfactory operation and economy through the use of separate control valves combined with a master thermostatic mixer placed on each battery of showers, which controls the hot water supply at bath temperature (108° to 110°), so that immediately upon opening the hot water valve one has bath temperature. We have used various kinds of individual shower mixers but find the system mentioned above much more satisfactory."

SHOWER ROOM FLOOR

"In the shower room tile is replacing concrete as the desired flooring. Several kinds of tile are suggested, including mosaic, granolithic, terrazza, and non-slip." (1) Non-slip qualities should be given very serious consideration.

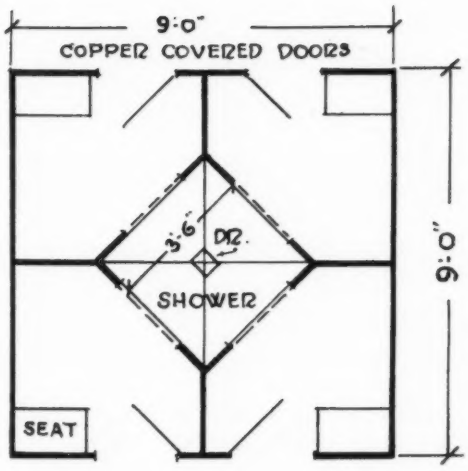
MECHANICAL EQUIPMENT

HEATING

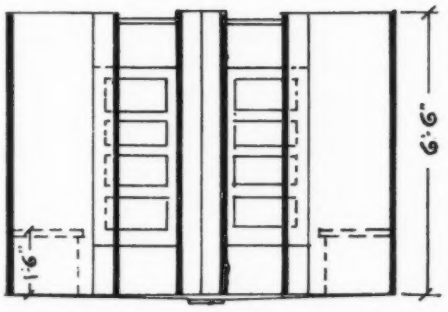
Gymnasium buildings have rather special heating requirements. The gymnasium room, courts and special exercise rooms should be kept at from 55° to 60° F., the shower and swimming pool rooms at 80° F., the locker rooms at 76° F., and the remainder of the building at 70° F.

The gymnasium section may require heat intermittently, while the other portions would require heat continuously. These portions are therefore often separated or zoned and controlled separately. The differential system lends itself particularly to the heating of this type of building, due to adjustability to zoning and the ability to closely balance the radiation to the heat losses by use of the regulating plates.

With the differential system, through changes from 5 pounds steam pressure to a vacuum of 15 inches or less, it is possible to vary the temperature of the radiator from 225° F. or higher for very cold weather or for rapid heating of a room to 133° F. for mild weather. This flexibility makes for comfortable and economical heating.

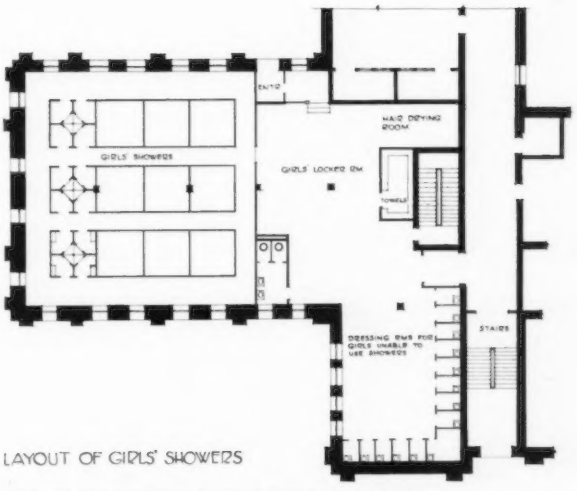


PLAN



SECTION

DETAILS OF SHOWERS



LAYOUT OF GIRLS' SHOWERS

GIRLS' SHOWERS AND DRESSING ROOMS
WHITE PLAINS HIGH SCHOOL, NEW YORK
STARRETT, AND VAN VLECK, ARCHITECTS

The gymnasium-auditorium of the Chicago Turn Verein is heated to only 50° by the direct radiators. The 70° required when used as an auditorium is obtained by the additional output of unit heaters, which are located on either side of the stage.

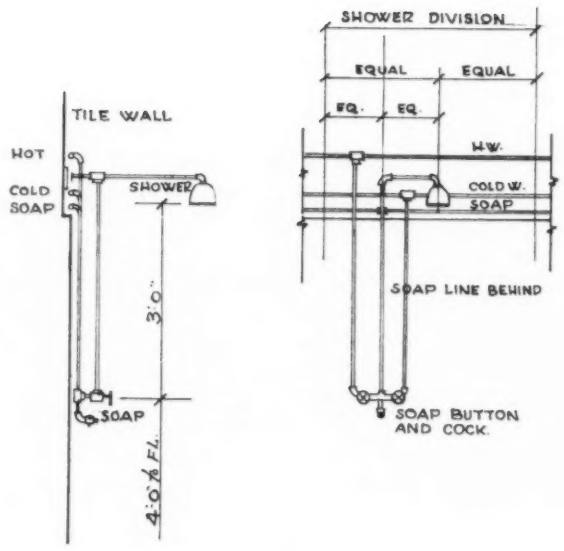
LIGHTING

"Lights must be so placed as not to glare into the eyes of users of the gymnasium or spectators at match games . . . Lights on the ceiling should be so placed as to avoid throwing shadows from the girders. They should be accessible without the use of a scaffolding or ladders. All lights should be recessed and covered with wire baskets securely fastened to wall or ceiling so that the impact of the ball will not shake the lighting fixture."

Light switches should be conveniently located to encourage turning off lights when not in use. In order to prevent boys playing with the lights it will be advisable to use key switches.

CUSPIDORS AND DRINKING FOUNTAINS

Cuspidors and drinking fountains should be provided on the walls of the gymnasium at several convenient points, depending on the size of the gymnasium. A set should be placed near the door leading from the locker room to the gymnasium as the men will want a drink when leaving; and the cuspidor will be needed as a place for the disposal of chewing gum when the men come on to the gym floor. The cuspidor should be a different color from the drinking fountain and they should both be recessed in the wall so as to avoid any chance of injury to players.



DETAILS OF SHOWER PIPING

PIPING

"All piping in the gymnasium should be in pipe chases. Canvassed asbestos covering is not satisfactory for pipes subject to contact in a gymnasium, as this covering is soon destroyed by rough usage." (10)

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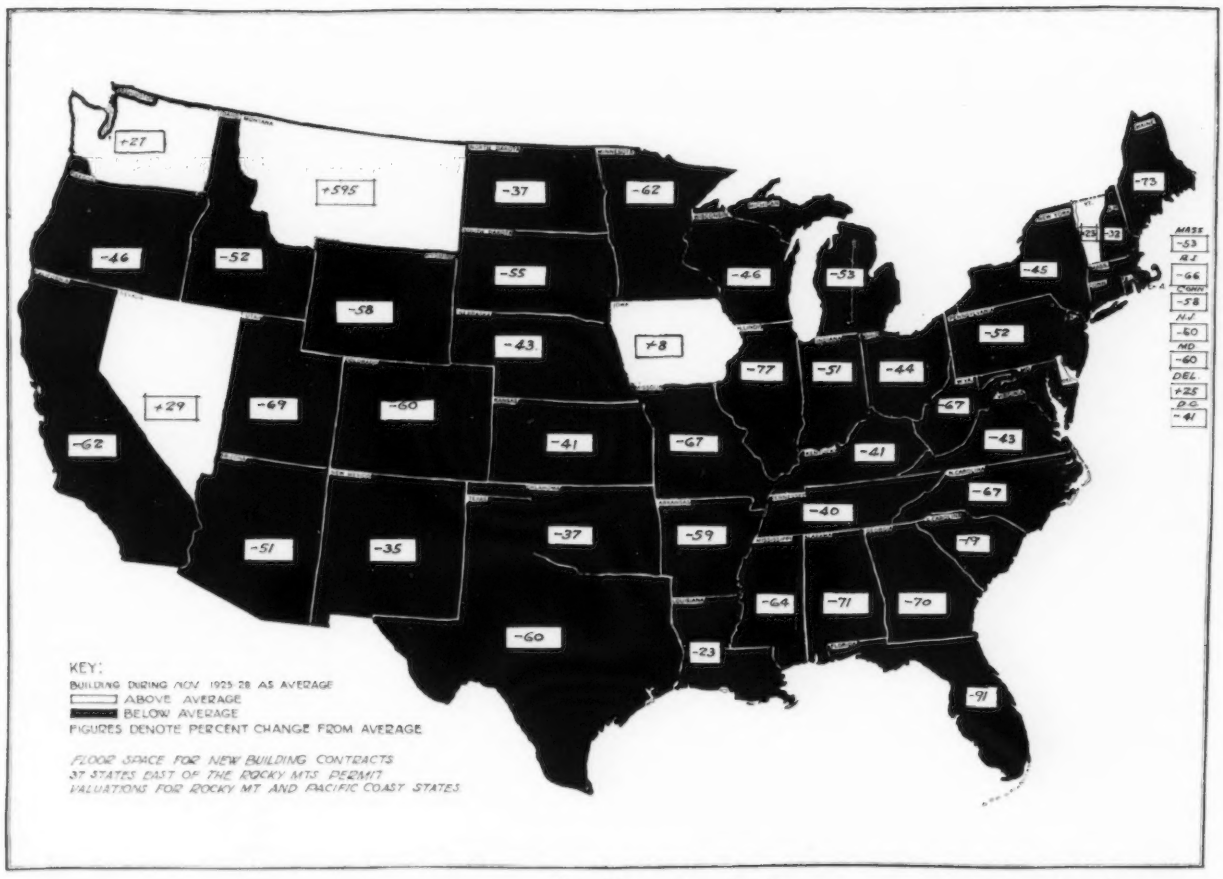


The November building map revealed somewhat the same spottiness that has characterized earlier months with no important state exhibiting sustained ability to break out of the doldrums. Six states reported larger building volumes than average (November, 1925-1928): Vermont, Delaware, Iowa, Montana, Nevada and Washington.

BUILDING TRENDS AND OUTLOOK

THE INTERRELATIONSHIP OF THE BUILDING AND AUTOMOBILE INDUSTRIES

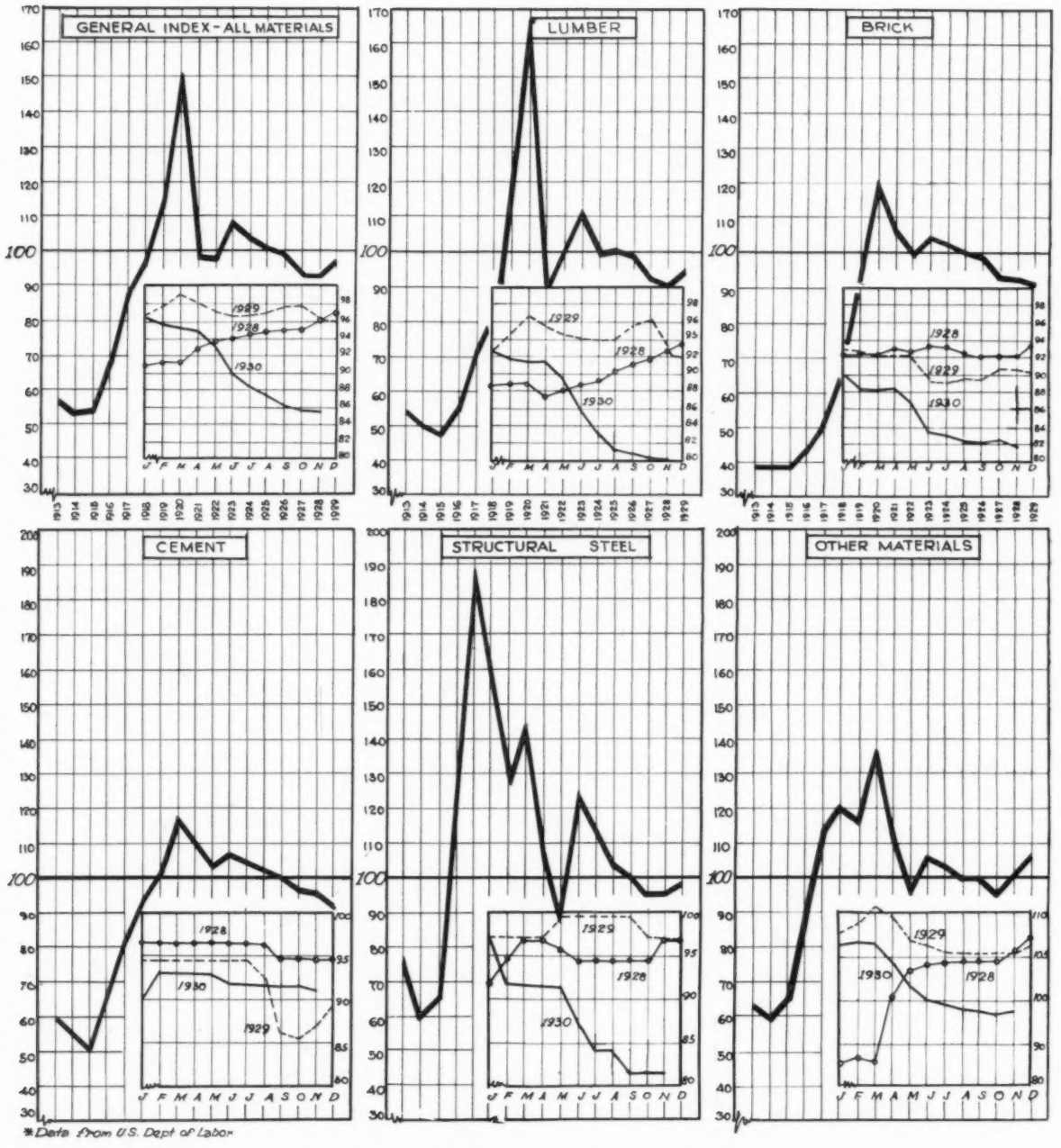
Each new mode of locomotion has strengthened the kinship between transportation and shelter, and the economic interdependence of one upon the other has never been so strong as it is today. Modern transportation numbers many instrumentalities of which the automobile is of large importance. Present-day shelter counts many facilities of which the dwelling is but one manifestation—the store, the office, the factory, the school are others.

Halt building activity in America, and business and industry of the nation is at once bridled. At least one out of every ten employed adults is normally gainfully occupied in construction processes or in the production of building materials and equipment. Stifle the automobile industry with its employment to at least half as many more and our industrial structure becomes undermined. Writing of this interrelationship in the Yearbook of the Construction Industry for 1928, the author stated: "Were the building industry to have sloughed at the time when automobile factories were shut down (in 1927) this condition might conceivably have signalized a depression in business. But the stability in the building industry and the high awards for new construction presaged ensuing activity as large at least as that previously recorded. Large building contracts meant large employment in the building trades and large demand for materials and equipment. Large employment in the building trades meant good markets for clothing, food, shelter, automobiles, radio, electric refrigeration. Good

(*Continued on page 92, advertising section*)

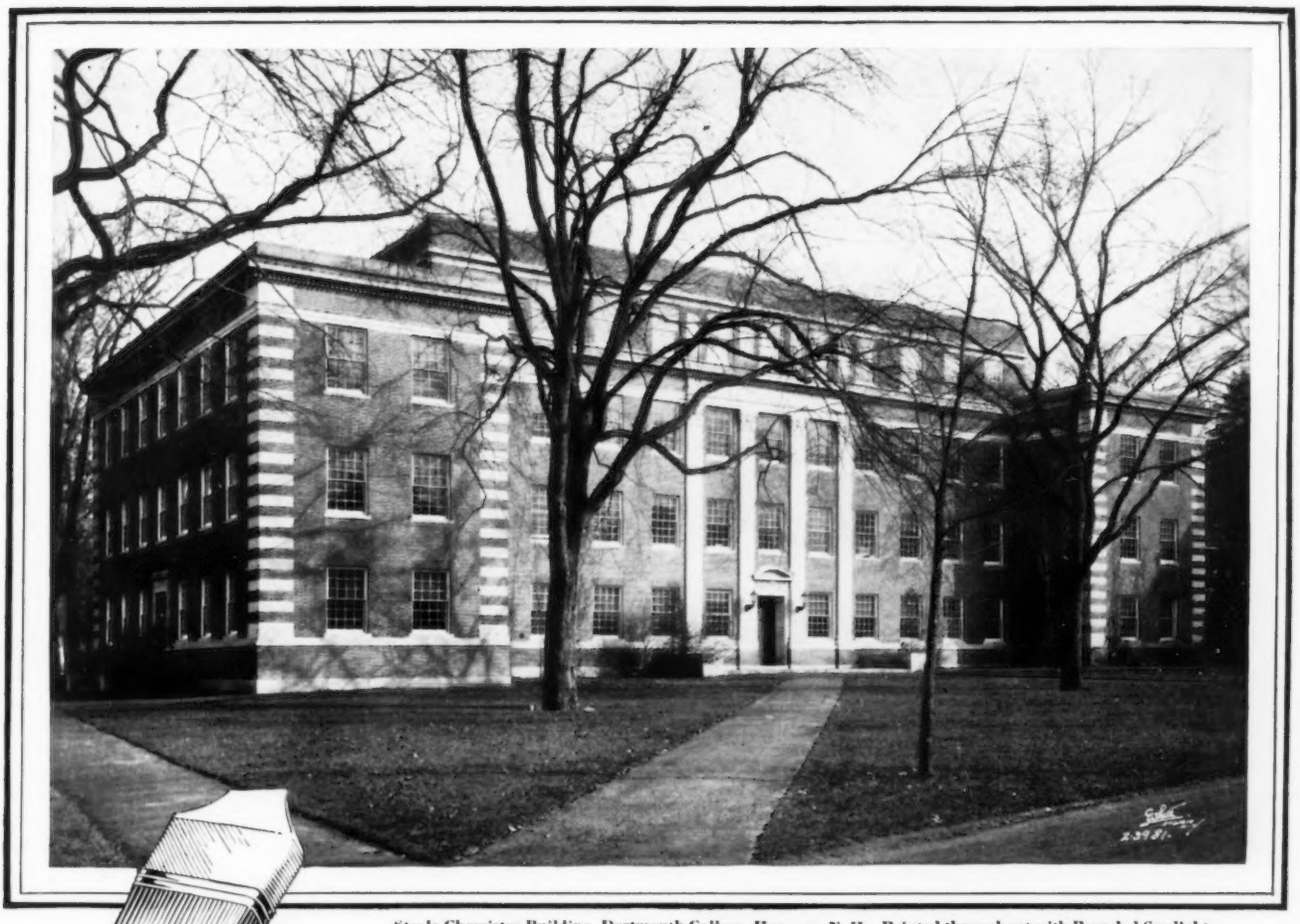
WHOLESALE PRICES FOR BUILDING MATERIALS

1926 Monthly Average = 100



*Data from U.S. Dept of Labor

Building material prices, as measured by the general index of the U. S. Department of Labor, were fractionally lower in November than in October and showed an index about 11 per cent lower than in November a year ago. The level of material prices, however, was still above the index of general wholesale prices, which in November had shown a recession from a year ago of almost 15 per cent. Prices for lumber, brick and cement receded from the October levels, while structural steel remained unchanged and the index for other building materials showed a fractional gain. The most drastic decline from last year was recorded in the price of structural steel where the decrease amounted to 16 per cent; the decline in lumber prices was 13 per cent; for brick, almost 10 per cent; and for cement, only 5 per cent. The relatively small decrease in cement prices in the face of larger declines elsewhere was reflective of the demand of road building and other public works construction where cement is the principal material and where activity has been well maintained throughout the year.



Steele Chemistry Building, Dartmouth College, Hanover, N. H. Painted throughout with Barreled Sunlight

In one of Dartmouth's Finest Buildings

INTERIOR painted surfaces are conspicuously good looking, with a pronounced lustre, a rich depth . . . corridors, classrooms, laboratories are suffused with a soft, agreeable working light . . . walls and ceilings are immaculately clean . . . Dartmouth's Steele Chemistry Building is painted throughout with Barreled Sunlight.

Are you concerned with interior painting? Let us tell you more about Barreled Sunlight. Let us send you the facts on its long-lasting whiteness and cleanliness . . . its washability . . . its ease of tinting . . . its durability and low maintenance cost. Mail the coupon.

U. S. Gutta Percha Paint Co., A-22 Dudley Street, Providence, R. I. Branches: New York, Chicago, San Francisco. Distributors in all principal cities.

Barreled
Reg. U. S. Pat. Off.
Sunlight

Easy to Tint

An all-oil product, Barreled Sunlight is readily tinted any desired shade with ordinary colors in oil. Quantities of 5 gallons or over are tinted to order at the factory without extra charge.

U. S. GUTTA PERCHA PAINT CO.
A-22 Dudley Street, Providence, R. I.

Please send us your descriptive booklet and a panel painted with Barreled Sunlight. We are interested in the finish checked here.

Gloss ( ) Semi-Gloss ( ) Flat ( )

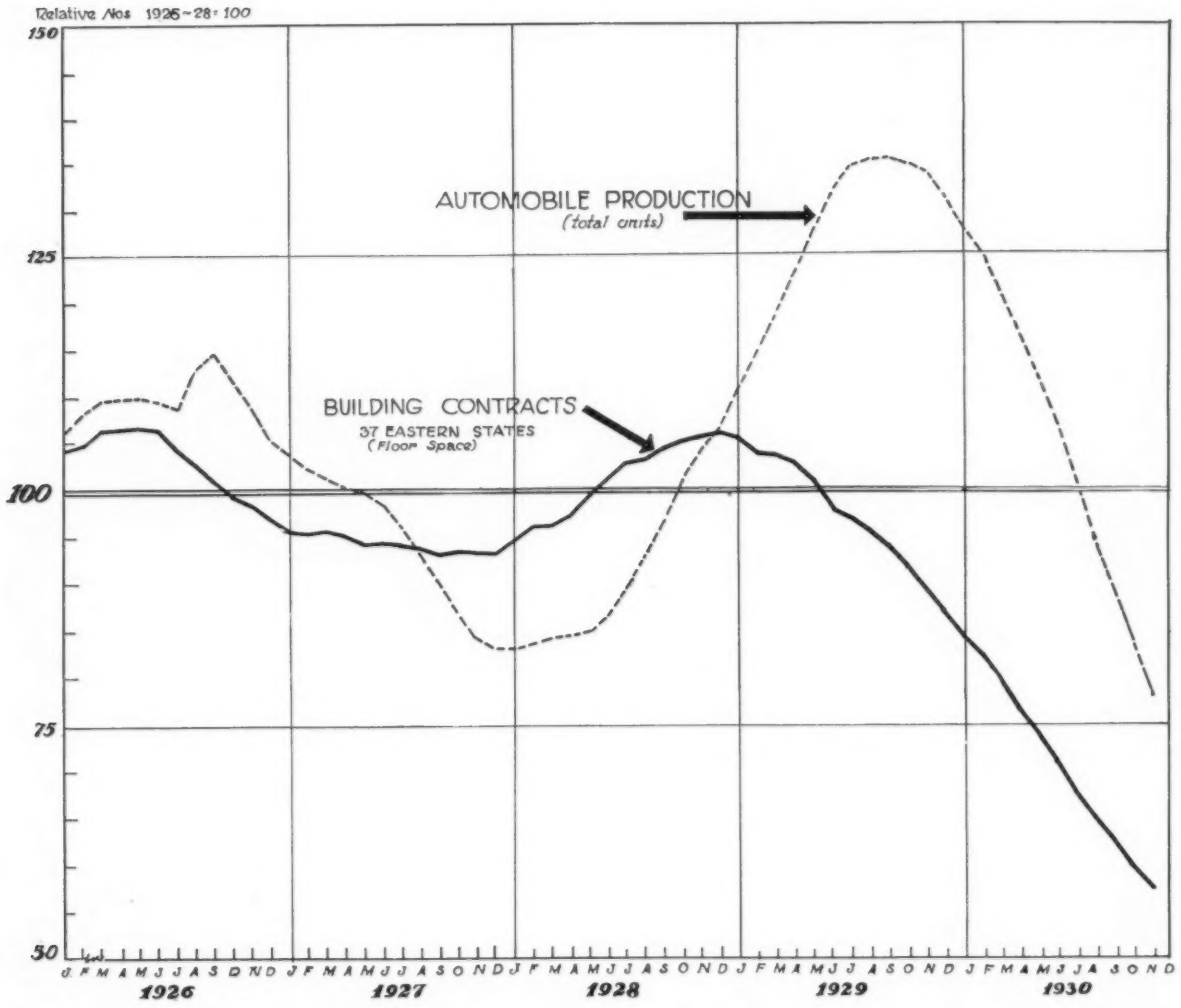
Name.....

Street.....

City.....State.....

TREND OF BUILDING IN 37 EASTERN STATES

A comparison between the trend of building contracts and the trend of automobile production.



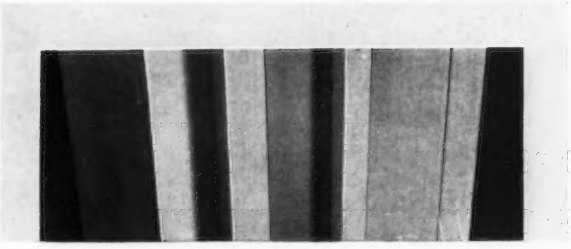
The prosperity of the decade which ended with the year 1929, was very definitely identified with the progress in two industries, building and automobiles. Just so long as the trend in both had been upward general business and industry were on the incline; when the trend of both was downward, a decline in business was foreshadowed. Major changes in the trend of building have preceded similar movements in automobile production.

The present decline in contracts awarded for new building, which was first evidenced in January, 1929, was a preliminary indicator of the impending major depression which is with us today. This indication was partially confirmed in August, 1929, and more definitely confirmed in September and October by the reversal in the trend of automobile output.

Going back to the year 1926 the trend in building awards disclosed at midyear a preliminary indication of decline. This was confirmed by a declining trend in automobile output in October of the same year.

For building the downward trend of contracts has now lasted two full years. For automobile production the decline has been unbroken for fifteen months. In the face of this it is not unlikely that the downward trend in automobile output will carry through for most of the months of 1931 if the lag between the building cycle and the automobile cycle manifested in 1926 and 1927 may be taken as a guide.

On the whole the year 1931, it now appears, will show new building volume not far different from that of the year 1930. Neither is it likely that automobile output, if manufacturers are as mindful of conditions of demand as now seems apparent, will show any material change for the entire year 1931 from the year that has just closed.



Sill and jambs lock tight with this new frame . . stop air and water leaks!

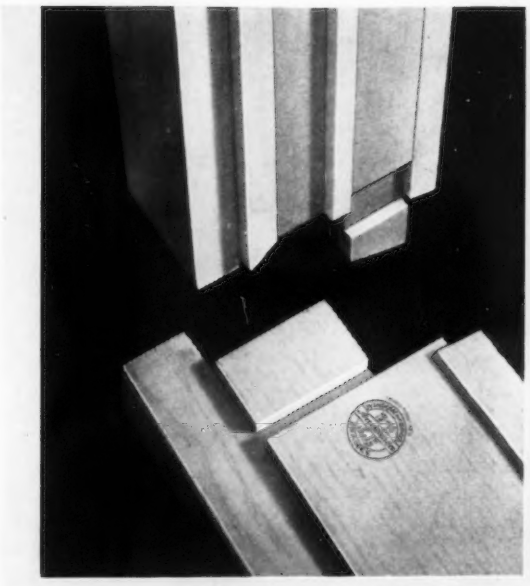
Newest Andersen patents give architect weathertight installation

FOR THE MODERN HOME or building, architects are turning to window and door frames of genuine white pine . . . made by Andersen . . . and now equipped with the new locked sill-joint, 3″ per foot sill slope, wide blind stop and other exclusive features. Notice how sill and jambs lock in place . . . accurate, rigid and leakproof.

In Andersen's new Master Frame, the architect finds a high standard of accuracy, plus the patented details which insure a permanent, weathertight installation. Each frame is equipped with Andersen patented noiseless pulleys—guaranteed for a lifetime of noiseless, trouble-free operation.

Also, these new models, made to fit every architectural need, have a beauty never before attained in wooden frames.

Andersen Frame Corporation, Bayport, Minnesota . . . represented by 4,000 leading jobbers and dealers.



Photograph showing sill and jamb dadoes before joint is closed.

Click! Sill and jamb lock together—rigid, leakproof.

Andersen MASTER Frames

TRADE MARK REG. WINDOW and DOOR Andersen FRAMES

See the 1931 Sweet's, B2273 *to* 2292

(*Continued from page 91, editorial section*)

markets for these products meant large production schedules in the factories producing them. The relationship, direct and indirect, is almost infinite."

Together the automobile and building industries reflect two of the most important items in the balance sheet of business. Any basic change in the trend in either has a marked effect upon industrial and commercial equilibrium; any change in both has an effect on general business so potent as to more than offset the combined effect of many opposing movements of lesser importance in other sections of our economic scheme.

The building and automobile industries alone have accounted in recent years for about 35% of the entire domestic consumption of steel. Lumber, copper, lead, rubber, cement, in greater or less degree, depend heavily upon the health of the building or automobile industries or both, to say nothing of artificial leather, lacquers, paints and the thousand and one other commodities which, when assembled, become the dwelling, the theater, the sedan, the truck. The utilization of basic materials by each of the two industries is not materially dissimilar, except as to formulas for their compounding. Cement and rubber are the only important exceptions and they are predominantly materials for one or the other.

The present decline in contracts awarded for new building, which was first evidenced in January, 1929, was a preliminary indicator of the impending major depression which is with us today. This indication was partially confirmed in August, 1929, and more definitely confirmed in September and October by the reversal in the trend of automobile output. What has happened since in the building and automobile industries and general business itself is now commonplace.

Going back to the year 1926 the trend in building awards disclosed at midyear a preliminary indication of decline. This was confirmed by a declining trend in automobile output in October of the same year. It will be recalled that general business during the closing months of 1926 was taking a breathing spell only to decline during the ensuing year which has since been recorded as one of mild depression. That business could have been seriously upset by the decision of one large automobile manufacturer to shut his plants for the change of models during 1927 is evidence not only of the importance of the automobile industry to economic well-being but even of the fineness of adjustment that exists between the many economic mechanisms that are as so many parts requiring proper lubrication.

For building the downward trend of contracts has now lasted two full years. For automobile production the decline has been unbroken for fifteen months. In the face of this it is not unlikely that the downward trend in automobile output will carry through for most of the months of 1931 if the lag between the building cycle and the automobile cycle manifested in 1926 and 1927 may be taken as a guide.

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The inventory position as respects the ultimate market is still pretty much the same for both building and automobiles. Markets for new building and automobiles are still dependent upon conditions of consumer demand and supply. Investors in building enterprises, whether it be dwellings, apartments, theaters or office buildings, are still overstocked to some extent. Defaults in interest payments on first mortgages are large. The consumer of automobiles is likewise somewhat overstocked in the light of present disturbed economic conditions. The old car may have to do some further double duty, excepting in cases of absolute replacement necessity and the well-to-do owners who have habitually traded their cars from year to year.

This brings us to a further analysis of the probable effect of curtailed automotive output upon new building. In 1930 the construction of garages, automobile factories, and the larger service stations approximated $100,000,000 for the entire country; it is probable in the light of a sluggish year for automobiles that a very substantial decrease from this figure will be registered in 1931. Thus the interdependence between the two industries becomes at once apparent.

The automobile brought with it a demand for new and ever better roads and highways; new building activity provided large employment to building artisans at high wage levels; incomes thus derived were used in the purchases of automobiles, among other comforts and necessities, dwellings, furnishings and the like. Good roads, automobiles, large incomes made possible real estate subdivisions and housing developments in our suburban areas.

Since it appears that in the field of new residential building the trend is in the direction of larger apartment houses in urban centers—though the single dwelling still is an important factor in housing—the elevator may become in effect a more important competitor of the automobile—a case of vertical transportation against horizontal locomotion. This development when it comes will bring a new freedom in architectural design, a fuller appreciation of the economics of materials and construction, and a closer approach to functional requirements of buildings.

It is indeed a far cry from the Phoenician sloop to the automobile, but each mode of transportation within extremes so far apart has brought measurable changes in our living habits. If the airplane or dirigible will become as commonplace as the automobile our offices, stores, dwellings will be quick to mirror the new order and our cities will take on skylines far different from those we know today.

L. Seth Schnitman

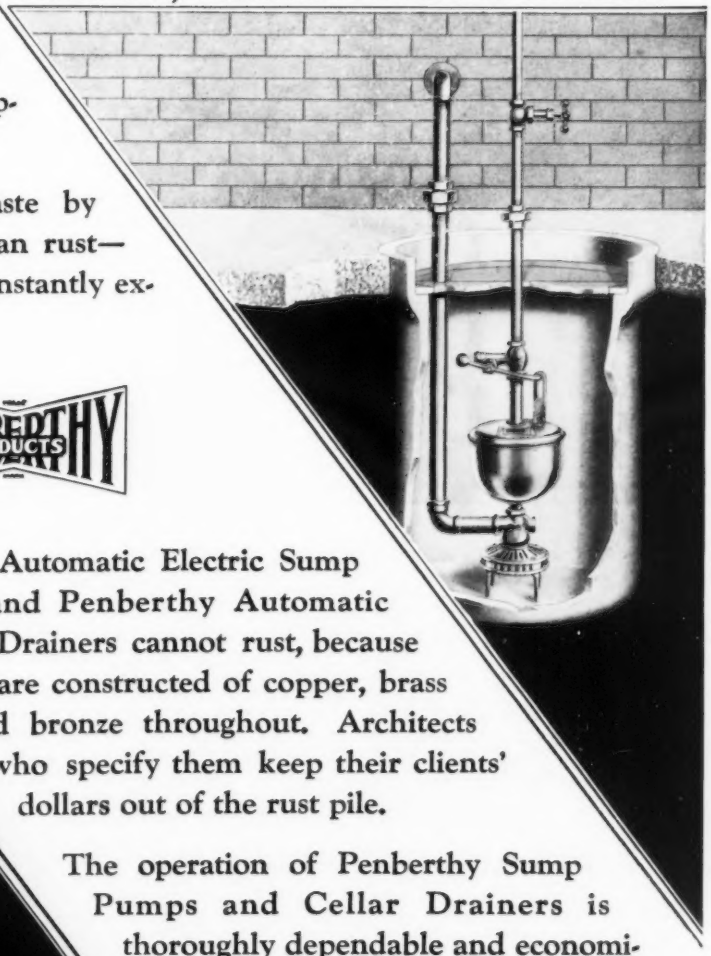
A $600,000,000 Waste!

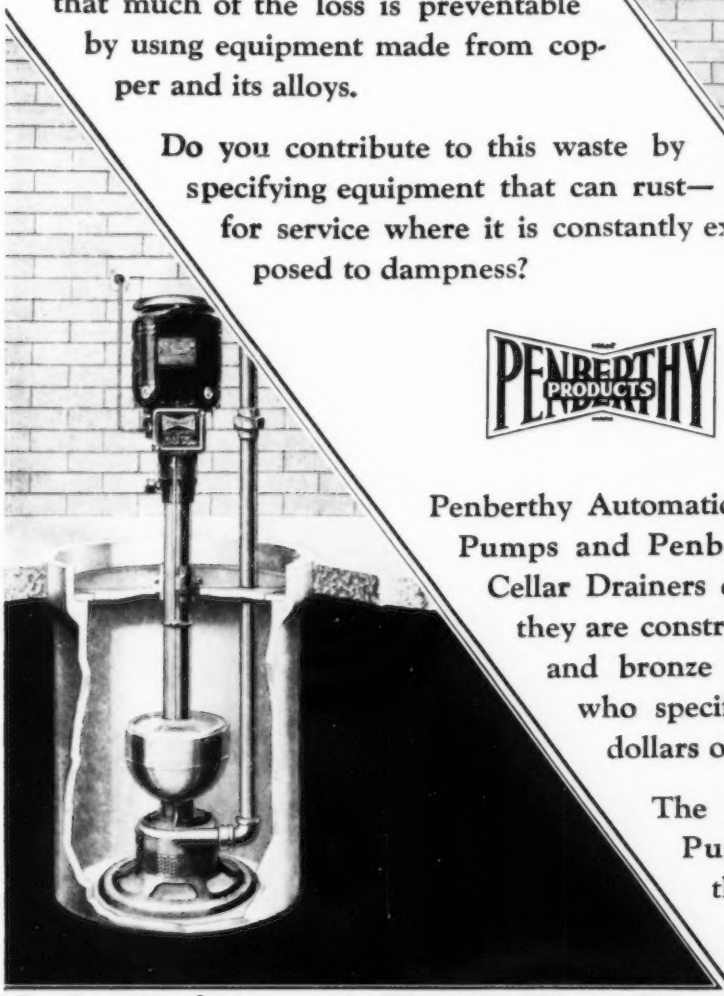
Are you responsible for a part of it?

The annual loss in the United States due to rust is estimated at $600,000,000. This figure is appalling—particularly when you realize that much of the loss is preventable by using equipment made from copper and its alloys.

Do you contribute to this waste by specifying equipment that can rust—for service where it is constantly exposed to dampness?

Penberthy Automatic Cellar Drainer





Penberthy Automatic Electric Sump Pump

PENBERTHY PRODUCTS

Penberthy Automatic Electric Sump Pumps and Penberthy Automatic Cellar Drainers cannot rust, because they are constructed of copper, brass and bronze throughout. Architects who specify them keep their clients' dollars out of the rust pile.

The operation of Penberthy Sump Pumps and Cellar Drainers is thoroughly dependable and economical. There is a size and type for every drainage requirement.

These Penberthy Pumps are quickly available—they are carried in stock by the leading jobbers throughout the country.

PENBERTHY INJECTOR COMPANY

ESTABLISHED IN 1886

DETROIT

CANADIAN PLANT WINDSOR, ONT.

NOTES IN BRIEF

A LETTER:
FAMOUS ARCHITECTS

THE EDITOR:

The letter* from Professor Joseph Hudnut to President Ricketts of Rensselaer Polytechnic, naming a list of the ten best architects of the United States, has in it an idea of much interest, one sure to provoke much discussion and no decisions—for concerning tastes there is no disputing. But I note with mingled feelings of awe and sadness the list suggested. I am properly impressed by the didactic finality of the professional utterance, but gaze on the list with grief. It is exactly what the teachers, most of them, would have us believe; but bless them, we have our own secret reservations. I note even that a necessary concomitant to being placed on the list is a state of death—maybe it should be phrased "suspended animation." Much could be said on this matter alone, but it seems to me at best a list definitely dated *fin de siecle*—to subscribe in which one must have died mentally in '99.

Let us go back to '99 if you wish. The Brochure Series came out in that year with new and modern ten best buildings, selected by the then architects, preening itself on the improved standard shown over a previous list of 1885. The list of the buildings and their authors is not of special interest but their definition of the mark of genius is—and can be just as well applied today—that "each of the buildings represents a conception clearly thought out, simply and forcibly expressed and treated with monumental dignity irrespective of decoration."

To my mind such a definition taboos office organizers—such as Burnham and his modern parallels like Albert Kahn, than whose office few can do better—it should also shunt out of the single track mind anyone who is not primarily a designer.

We must not put on our list younger men no matter how good—Grant Simon and Harry Sternfeld of Philadelphia, Burnham Hoyt of Denver, young Root and Holabird of Chicago, David Adler also of Chicago, and innumerable others: for theirs is still to do. We must keep out all house designers and small town men—those flowers doomed to waste their sweetness on the desert sticks; for of their works who is familiar enough to praise?

So here is a list, properly nominated for this "Hall of Fame"—by their good works will they be known. First the ancients—

McKim: concerning whom naught can be said but praise.

H. H. Richardson: an early master of the late Victorian period; a master in design, he helped formulate the American program.

(*Continued on page 96*)

* In the October, 1930, issue of The Record, page 98 (adv.).

VENTO

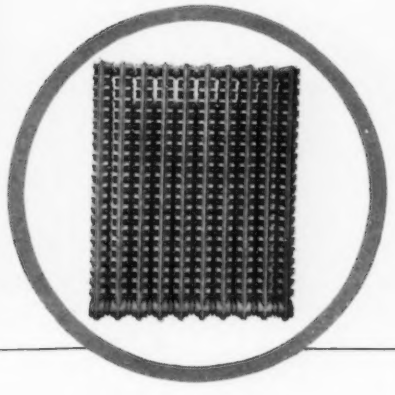
CAST IRON HEATERS

for BLOOMINGDALE'S

BLOOMINGDALE'S DEPARTMENT STORE

Architects—Starrett & Van Vleck
Consulting Engineer—E. E. Ashley
Blower Equipment—Buffalo Forge Co.
Heating Contractors—Almirall & Co., Inc.

- More than 20,000 square feet of Vento Cast Iron Heaters were installed in this large department store in New York City.
- Bloomingdale's not only secured heaters that will operate efficiently but will actually last as long as the building itself.
- We will be glad to send detailed information on Vento.



AMERICAN RADIATOR COMPANY

DIVISION OF

AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

816 So. Michigan Avenue, Chicago 40 West 40th Street, New York City

Sullivan: who to his honor fought a single-handed battle; ridiculed in his day, his architecture is now seen fraught with a strange beauty based on solid precepts.

Stanford White: whose work touched genius; who while working in a single style inspiringly modified it by his splendid feeling for the beautiful.

And the later men, some of whom still live to do more and better work—

Paul Cret: designer of the Pan-American Union, Detroit Art Museum, Rodin Gallery and other masterpieces; master-designer, master-teacher, whose genius has fired innumerable pupils; a modern in spirit yet in full touch with inspiration of earlier generations.

Milton Medary: past president of the A.I.A.; designer of Valley Forge Chapel, Bok Tower and other great works; who combined the genius of the designer with an infinite capacity for taking pains.

Frank Lloyd Wright: designer of the Imperial Hotel at Tokyo, Canberra in Australia; a thinker of first water, more honored abroad than at home; his architecture is sincere and truly his own.

Claude Bragdon of Rochester: delver into the mysteries of projective ornament, designer of stage settings for the "Miracle" and other romantic works; inspirer of creative endeavor.

Edgarton Swartwout: designer of the Elks Memorial, Missouri State Capitol; a man who single-handed and with no office organization carried out great buildings; truly answering the requirements that the architect be entirely responsible for works bearing his name.

Eliel Saarinen: now living in this country; a man of original thought and great force whose work sanely illustrates the imaginative conceptions of his generation.

And as substitutes on this line-up, we have waiting on the bench a list which cannot be all-inclusive—fit men like Goodhue, Mulgardt of San Francisco, Cram of Boston, Hood of New York, Delano or Aldrich (I don't know which, maybe both) John Russell Pope, Hirons, Platt, Aymar Embury who built a whole town at Southern Pines: all designers of the works credited to them. Maybe there are some more keystones on which their names could be inscribed.

I would make a final suggestion—that if the scheme is adopted let the Regents provide in the main hall suitable niches wherein the works of these men are shown: the drawings made by themselves, the photographs by Sigurd Fischer; so that not only by their names will they be known, but also by their labor. Then truly will their genius greatly inspire the rising youth; then will creative endeavor be marked with a white stone; then will their names be praised for works accomplished.

Yours very truly,

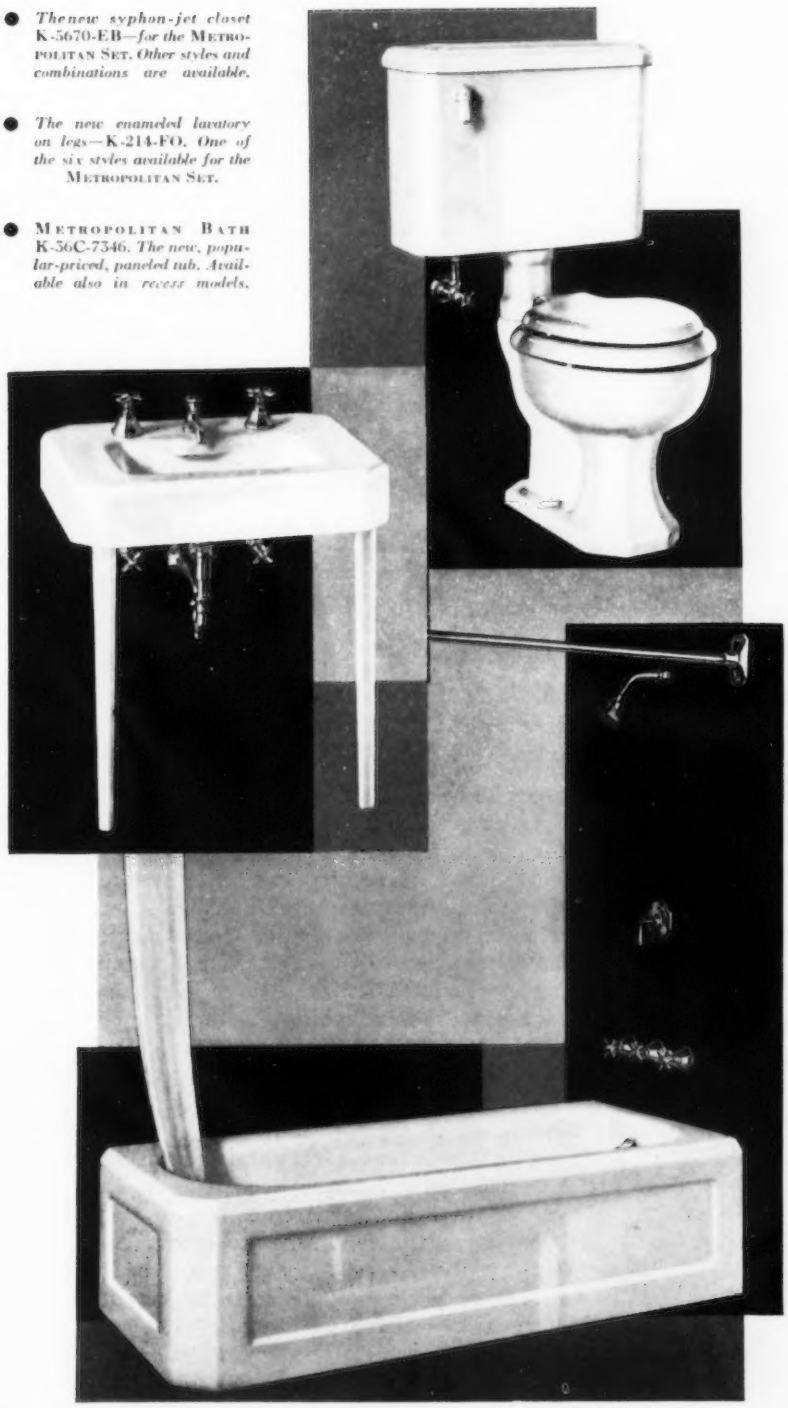
Frederick A. Muhlenberg, A.I.A.

NEWS

THE "Metropolitan Set"... MATCHED FIXTURES

A BRAND-NEW SERIES OF RELATED FIXTURES AND FITTINGS—MODERN, BEAUTIFUL, DESIGNED TO HARMONIZE ESPECIALLY WITH EACH OTHER. ORIGINAL WITH KOHLER!

- *The new syphon-jet closet* K-5670-EB—*for the* METROPOLITAN SET. *Other styles and combinations are available.*
- *The new enameled lavatory on legs*—K-214-FO. *One of the six styles available for the* METROPOLITAN SET.
- METROPOLITAN BATH K-36C-7346. *The new, popular-priced, paneled tub. Available also in recess models.*



IF YOU'VE had your eye on plumbing trends, you've watched the demand for matched fixtures gather speed. Bathrooms, important as they are, have been getting brighter, more important all the time. And lately, home-hunters and home-owners, keen about the decorative effect, have been asking for lavatories, baths, and closets *that go together.*

Now, for the first time in plumbing history, a manufacturer is deliberately merchandising these related fixtures and fittings — at popular prices! Knowing your bathroom, knowing the architectural treatment of the house, you simply choose the Kohler set which best suits. Easy as one-and-two! And from the smooth shining glaze of the enamel or vitreous china, to the distinguished fittings, *every* fixture in that set agrees perfectly in design, style, quality, and color with the others!

The first of the new sets is illustrated —an exclusive Kohler design. You have a choice of sizes and models. Octachrome fittings are new, too—made of the finest brass, they do their work surely, silently, positively. . . . All-Kohler plumbing is a lifetime investment in comfort. Complete Kohler bathrooms with matched fixtures, a great step forward, promise unfailing beauty and satisfaction.

Kohler Co. *Founded* 1873. Kohler, Wis.—*Shipping Point,* Sheboygan, Wis. —*Branches in principal cities.* . . . Look for the Kohler trade-mark on each fixture and fitting.

KOHLER OF KOHLER

ARCHITECTURAL AND ALLIED ARTS EXPOSITION

A more comprehensive idea of the evolution and development of works of art than is ordinarily presented at exhibitions of architecture and its kindred arts will be shown in the crafts and other exhibits at the Architectural and Allied Arts Exposition at the Grand Central Palace next April. At the forthcoming exposition efforts will be made to plan exhibits so that the public will see recorded the development of an individual piece of art from the initial sketch until its final stage as a finished work and also to trace the history of the industry as a whole by means of pictures and old and modern examples of craftsmanship.

Recognition of the relationship between architecture and its sister arts of painting and sculpture to the crafts has gained considerable momentum since the craftsmen of the decorative arts were first invited to participate in the annual exhibits of the Architectural League of New York under the presidency of Grosvenor Atterbury a few years ago. By exhibiting the decorative arts alongside the fine arts, the League has given expression to the alliance of all the arts as exemplified in its governing personnel. The organization provides that its president and four vice-presidents shall be, respectively, an architect, a mural painter, a sculptor, a landscape architect and a craftsman.

The crafts will constitute a significant part of the big exposition to be held in April under the auspices of both the Architectural League of New York and the American Institute of Architects. It is the fourth biennial event of its kind, in each of which the decorative arts have occupied positions of importance with comprehensive exhibits in metal, glass, ceramics, textiles and other materials.

THE JAMES HARRISON STEEDMAN MEMORIAL FELLOWSHIP IN ARCHITECTURE

The Governing Committee of the James Steedman Memorial Fellowship in Architecture announces the sixth competition for this fellowship.

This fellowship represents an award of $1,500 for foreign travel. The competition is open on equal terms to all graduates in architecture of recognized architectural schools of the United States. Such candidates must be American citizens of good moral character, and shall have had at least one year of practical work in the office of an architect practicing in St. Louis, Mo., before being entitled to assume the benefits of the fellowship. All candidates shall be between twenty-one and thirty-one years of age at the time of appointment.

Application blanks for registration can be obtained at any time upon written request addressed to the head of the School of Architecture of Washington University, St. Louis, Mo., to whom application blanks properly filled out must be returned not later than January 24. Any requests for supplementary information relative to the rules and regulations governing the competition shall be made at the same time.

UNUSUAL PLASTICITY

UNLESS the bricklayer is given good, rich, mortar, he cannot do quick, neat, economical brickwork. One part Brixment, three parts sand, makes a mortar plastic like a straight lime mix and strong as the brick itself.

It is unusually easy to spread, and when the bricklayer throws up a head-joint, the mortar sticks to the brick. Louisville Cement Company, Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830

Mills: Brixment, N. Y. and Speed, Indiana

BRIXMENT

for MASONRY and STUCCO

LE BRUN TRAVELING SCHOLARSHIP COMPETITION

The Executive Committee of the New York Chapter of the American Institute of Architects announces a competition for the selection of a beneficiary for the traveling scholarship founded by Pierre L. Le Brun. The program will be issued about January 15, calling for drawings to be delivered about March 15.

The award is $1,400 to be used in paying the expenses of an European trip lasting not less than six months. The conditions state that "any architect or architectural draftsman, a citizen and resident of the United States, not under twenty-three or over thirty years of age, who shall, for at least three years, have been either engaged in active practice, or employed as an architectural draftsman and who is not and has not been the beneficiary of any other travelling scholarship, shall be eligible to compete."

All those wishing to enter the competition should arrange at once for nomination by a member of the American Institute of Architects. Nomination blanks can be obtained from the secretary of any chapter, A. I. A., or from the LeBrun Scholarship Committee. Nominations should be sent, so as to be received before January 15, 1931, to LeBrun Scholarship Committee, Room 530, 101 Park Avenue, New York City.

BOOK REVIEWS

AMERICAN THEATRES OF TODAY, Vol. II. R. W. Sexton. *Architectural Book Publishing Co.*, N. Y., 1930. $13.50.

This is a continuation of Sexton's earlier volume on American Theatres. Additional layout data are offered and also worthwhile information on acoustics, heating and ventilating. The illustrations are representative of the current theatre which is neither modern nor traditional. Theatre architects have produced a type, generally redundant with decoration, both outside and within. Our theatres are fairly well planned. The charts, plans and sections make the book of value to architects concerned in theatre design.

SWEET'S ARCHITECTURAL CATALOGS, 1931 Edition. *F. W. Dodge Corp.*, N. Y.

Sweet's in its new edition totals over six thousand pages of information on building materials, equipment and specification data. The value of this publication has been multiplied because of its greater completeness, due to the inclusion of entire catalogs of manufacturers. The appearance of the catalogs has been freshened by new covers in green and yellow. A summary of the main subjects covered by Sweet's is listed on the back to save time for draftsmen and architects.